User Guide

Ruckus Wireless ZoneDirector
Release 7.0

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Contact Information

Ruckus Wireless

880 West Maude Ave, Suite 101

Sunnyvale, CA 94085

USA

Support

http://support.ruckuswireless.com

Web

http://www.ruckuswireless.com

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CHAPTER 1

Introducing ZoneDirector

Ruckus Wireless ZoneDirector serves as a central control system for Ruckus ZoneFlex access points (also referred to as APs). ZoneDirector provides simplified configuration and updates, WLAN security control, RF management, and automatic coordination of Ethernet-connected APs.

ZoneDirector also integrates network, radio frequency (RF), and location management within a single system. User authentication is accomplished with an integrated captive portal and internal database, or forwarded to existing AAA servers, such as RADIUS or Active Directory. Once users are authenticated, client traffic is not required to pass through ZoneDirector, thereby eliminating potential bottlenecks as higher speed Wi-Fi technologies, such as 802.11n, emerge.

In addition, ZoneDirector supports rogue AP detection and the ability to blacklist client devices from the network—all of which are easily configured and enabled system-wide. When multiple APs are in close proximity, ZoneDirector automatically controls the power and the channel settings on each AP to provide the best possible total coverage and resiliency.

This user guide provides complete instructions for using the Ruckus Wireless Web interface, the wireless network management toolbox for ZoneDirector. With the Web interface, you can customize and manage all aspects of ZoneDirector and the network. You will find all management tasks have been organized as categories and topics in the Contents page.

FIGURE 1-1: ZoneDirector 3000

FIGURE 1-2: ZoneDirector 1000

ZoneDirector Physical Features

This section describes the physical features of ZoneDirector 1000 and ZoneDirector 3000.

Buttons, Ports, and Connectors

Table 1 describes the buttons, ports, connectors on ZoneDirector 1000 and ZoneDirector 3000.

Table 1: Buttons, ports, and connectors on ZoneDirector 1000 and ZoneDirector 3000

Label	ZoneDirector 1000	ZoneDirector 3000
Power	(Located on the front panel) Press this button to power on ZoneDirector.	(Located on the rear panel) Press this button to power on ZoneDirector.

Table 1: Buttons, ports, and connectors on ZoneDirector 1000 and ZoneDirector 3000

Label	ZoneDirector 1000	ZoneDirector 3000
Console	DB-9 port for accessing the ZoneDirector command line interface	RJ-45 port for accessing the ZoneDirector command line interface.
10/100/1000 Ethernet	Two auto negotiating 10/100/1000Mbps Ethernet ports. For information on what the two Ethernet LEDs indicate, refer to Table 2, "Front Panel LEDs," on page 4	
Reset	Use the Reset button to restart ZoneDirector or to reset it to factory default settings. • To restart ZoneDirector, press the Reset button once. • To reset ZoneDirector to factory default settings, press the Reset button for at least five (5) seconds. For more information, refer to *"Alternate Factory Default Reset Method"* on page 37. *WARNING: Resetting ZoneDirector to factory default settings will erase all configuration changes that you have made.*	To restart ZoneDirector, press the Reset button once.
F/D (ZoneDirector 3000 only)	Does not exist	To reset ZoneDirector to factory default settings, press the F/D button for at least five (5) seconds. For more information, refer to *"Alternate Factory Default Reset Method"* on page 37. *WARNING: Resetting ZoneDirector to factory default settings will erase all configuration changes that you have made.*
USB	Does not exist	For Ruckus Wireless Support use only

Front Panel LEDs

Table 2 describes the LEDs on front panel of ZoneDirector.

Table 2: Front Panel LEDs

LED Label	State	Meaning
Power *Note: On ZoneDirector 1000, the Power LED is embedded into the Power button on the front panel.*	Green	ZoneDirector is receiving power.
	Off	ZoneDirector is NOT receiving power. If the power cable or adapter is connected to a power source, verify that the power jack is connected properly to the power connector on the rear panel of ZoneDirector.
Status	Green	Normal state
	Flashing Green	ZoneDirector has not yet been configured. Log in to the Web interface, and then configure ZoneDirector using the setup wizard.
	Amber	ZoneDirector has shut down (but is still connected to a power source).
	Flashing Amber	ZoneDirector is starting up or shutting down.
Ethernet Link	Green	The port is connected to a device.
	Flashing Green	The port is transmitting or receiving traffic.
	Off	The port has no network cable connected, or is not receiving a link signal.
Ethernet Rate	Amber	The port is connected to a 1000Mbps device.
	Green	The port is connected to a 100Mbps device.
	Off	The port is connected to a 10Mbps device.

Overview of a Ruckus Wireless Network

Your new Ruckus Wireless network starts when you disperse a number of Ruckus Wireless access points (APs) to efficiently cover your worksite. After you connect the APs to ZoneDirector (through network hubs or switches) and complete the "zero IT" setup, you have a secure wireless network for both registered users and guest users.

NOTE

"Zero IT" refers to ZoneDirector's simple setup and ease-of-use features, which allow end users to easily configure wireless settings on the following Microsoft Windows clients:

- Windows Vista
- Windows XP
- Windows Mobile
- Windows CE

After using the Web interface to set up user accounts for staff and other authorized users, your WLAN can be put to full use, enabling users to share files, print, check email, and more. And as a bonus, guest workers, contractors and visitors can be granted controlled access to your Ruckus WLAN with a minimum of setup.

You can now fine-tune and monitor your network through the Web interface, which assists you to customize additional WLANs for authorized users, manage your users, monitor the network's safety and performance, and even expand your radio coverage, if needed.

Ensuring That APs Can Communicate with ZoneDirector

Before ZoneDirector can start managing an AP, the AP must first be able to discover ZoneDirector on the network when it boots up. This requires that ZoneDirector's IP address be reachable by the AP (via UDP/IP port numbers 12222 and 12223), even when they are on different subnets.

This section describes procedures that you can perform to ensure that APs can discover and register with ZoneDirector.

NOTE	This guide assumes that APs on the network are configured to obtain IP addresses from a DHCP server. If APs are assigned static IP addresses, they must be using a local DNS server that you can configure to resolve the ZoneDirector IP address using `zonedirector.{DNS domain name}` or `zonedirector` (if no domain name is defined on the DNS server.

ALERT!	ZoneDirector and the ZoneFlex access points can communicate with each other via Layer 2 or Layer 3. If Layer 2 connectivity is desired, both ZoneDirector and the access points must be on the same broadcast domain (VLAN) and the same IP subnet.

How APs Discover ZoneDirector on the Network

1. When an AP starts up, it sends out a DHCP discover packet to obtain an IP address.
2. The DHCP server responds to the AP with the allocated IP address. If you configured DHCP Option 43 (see *"Option 2: Customize Your DHCP Server"* on page 7), the DHCP offer response will also include (among others) the IP addresses of ZoneDirector devices on the network or the DNS server that can help resolve the ZoneDirector IP addresses.
   - The AP will attempt to register with the ZoneDirector device that it previously registered with (if any). This ZoneDirector can be on the same local IP subnet or a different subnet. The AP will have a preference for a ZoneDirector device that it previous registered with (over a locally connected ZoneDirector).
3. After the AP obtains an IP address, it first attempts to discover if there is a ZoneDirector device on the same subnet by broadcasting an Ethernet *discovery request* frame (Layer 2 LWAPP message).
   - If the AP receives response from a single ZoneDirector device, it will attempt to register with that ZoneDirector device.

- If the AP receives response from multiple ZoneDirector devices, it will attempt to register with the ZoneDirector device that it previously registered with (if any). If this is the first time that the AP is registering with ZoneDirector, it will attempt to register with the ZoneDirector device that has the lowest AP load. The AP computes the load by subtracting the current number of APs registered with ZoneDirector from the maximum number of APs that ZoneDirector can support.

4 If the AP does not receive a response on the L2 network, it builds a list of ZoneDirector IP addresses that it received through Option 43 in the DHCP offer response in Step 2, or it uses the DNS server information to resolve the host name `zonedirector.{DNS domain name}`.

5 The AP sends out an IP discovery packet (Layer 3 LWAPP message) to the IP address list to attempt to discover ZoneDirector devices on other subnets.

- If the AP receives response from a single ZoneDirector device, it will attempt to register with that ZoneDirector device.
- If the AP receives response from multiple ZoneDirector devices, it will attempt to register with the ZoneDirector device that it previously registered with (if any). If this is the first time that the AP is registering with ZoneDirector, it will attempt to register with the ZoneDirector device that has the lowest AP load. The AP computes the load by subtracting the current number of APs registered with ZoneDirector from the maximum number of users that ZoneDirector can support.

If the AP does not receive response from any ZoneDirector device on the network, it goes into idle mode. After a short period of time, reattempt to discover ZoneDirector again by repeating the same discovery cycle. The AP will continue to repeat this cycle until it successfully registers with ZoneDirector.

How to Ensure That APs Can Discover ZoneDirector on the Network

If you are deploying the AP and ZoneDirector on different subnets, you have three options for ensuring successful communication between these two devices:

- *Option 1: Perform Auto Discovery on Same Subnet, Then Transfer AP Intended to Subnet*
- *Option 2: Customize Your DHCP Server*
- *Option 3: Register ZoneDirector with a DNS Server*

If the AP and ZoneDirector Are on the Same Subnet

If you are deploying the AP and ZoneDirector on the same subnet, you do not need to perform additional configuration. Simply connect the AP to same network as ZoneDirector. When the AP starts up, it will discover and attempt to register with ZoneDirector. Approve the registration request, if auto approval is disabled.

Option 1: Perform Auto Discovery on Same Subnet, Then Transfer AP Intended to Subnet

If you are deploying the AP and ZoneDirector on different subnets, let the AP perform auto discovery on the same subnet as ZoneDirector before moving the AP to another subnet. To do this, connect the AP to same network as ZoneDirector. When the AP starts up, it will discover and attempt to register with ZoneDirector. Approve the registration request, if auto approval is disabled.

After the AP registers with ZoneDirector successfully, transfer it to its intended subnet. It will be able to find and communicate with ZoneDirector once you reconnect it to the other subnet.

NOTE	If you use this method, make sure that you do not change the IP address of ZoneDirector after the AP discovers and registers with it. If you change the ZoneDirector IP address, the AP will no longer be able to communicate with it and will be unable to rediscover it.

Option 2: Customize Your DHCP Server

To customize your DHCP server, you need to configure DHCP Option 43 (043 Vendor Specific Info) with the IP address of the ZoneDirector device on the network. When an AP requests for an IP address, the DHCP server will send a list of ZoneDirector IP addresses to the AP. If there are multiple ZoneDirector devices on the network, the AP will automatically select a ZoneDirector to register with from this list of IP addresses.

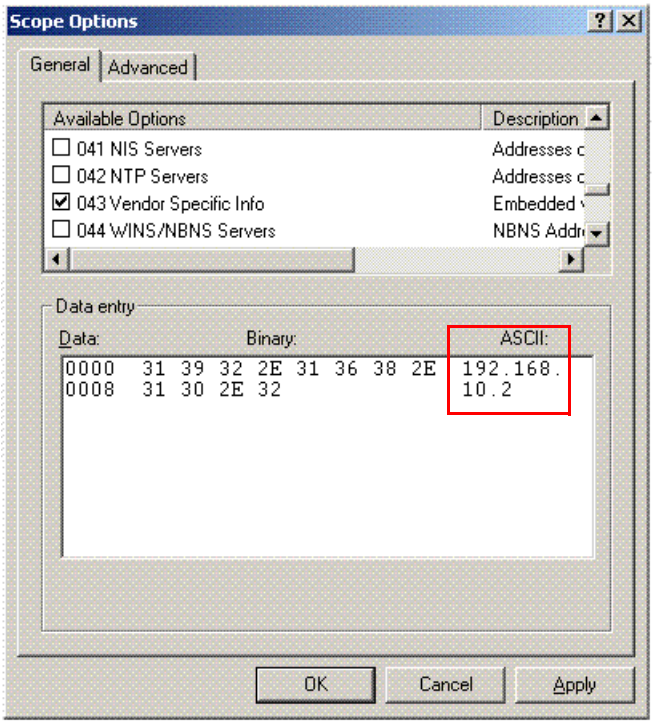
NOTE	The following procedure describes how to customize a DHCP server running on Microsoft Windows. If your DHCP server is running on a different operating system, the procedure may be different.

The procedure for configuring Option 43 on your DHCP server depends on whether both ZoneDirector and FlexMaster exist on the network.

If Only ZoneDirector Exists on the Network

1. From Windows Administrative Tools, open **DHCP**, and then select the DHCP server you want to configure.
2. If the **Scope** folder is collapsed, click the plus (+) sign to expand it.
3. Right-click S**cope Options**, and then click **Configure Options**. The **General** tab of the **Scope Options** dialog box appears.
4. Under **Available Options**, look for the **43 Vendor Specific Info** check box, and then select it.
5. Under **Data Entry**, position the cursor in the ASCII text area, and then type the IP address of the ZoneDirector device. In the figure below, the IP address of the ZoneDirector device is `192.168.10.2`.

FIGURE 1-3: In the ASCII area, type the IP address of the ZoneDirector device



The hexadecimal equivalent of the ZoneDirector IP address appears in the **Binary** text area.

NOTE

If there are multiple ZoneDirector devices on the network, type all the IP addresses in the ASCII text area. Use commas (,) to separate the IP addresses.

6 Click **Apply** to save your changes.

7 Click **OK** to close the **Scope Options** dialog box.

You have completed customizing your DHCP server to automatically provide supported APs with the ZoneDirector IP address.

If Both ZoneDirector and FlexMaster Exist on the Network

Before starting with this procedure, count the number of characters (including `http` or `https`, back slashes, colon, and periods) in the FlexMaster server URL and ZoneDirector IP address, and then convert these (decimal) values to hexadecimal. If there are multiple ZoneDirector devices on the network, count the total number of characters.

You will need this information when you configure DHCP Option 43 for both FlexMaster and ZoneDirector. You can use an online conversion Web site, such as http://www.easycalculation.com/decimal-converter.php, to perform the conversion.

The table below lists the FlexMaster URL and ZoneDirector IP address that are used as examples in this procedure, including their length in decimal and hexadecimal values.

Table 3: URL/IP address values that are used as examples in this procedure

	URL / IP Address	Decimal Length	Hexadecimal Length
FlexMaster	http://192.168.10.1/intune/server (URL)	33	21
ZoneDirector	192.168.10.2 (IP Address)	12	0C

Do the following on the DHCP server:

1 From Windows Administrative Tools, open **DHCP**, and then select the DHCP server you want to configure.

2 If the **Scope** folder is collapsed, click the plus (+) sign to expand it.

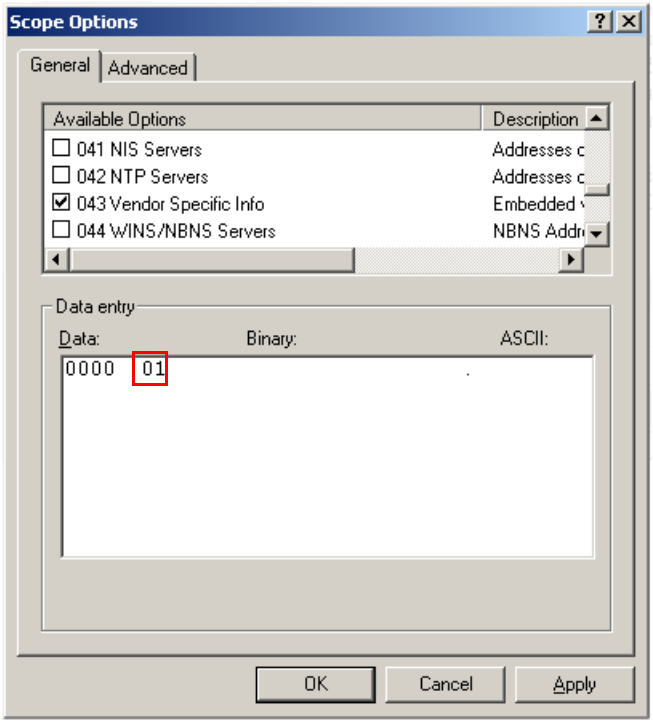
3 Right-click **Scope Options**, and then click **Configure Options**. The **General** tab of the **Scope Options** dialog box appears.

4 Under **Available Options**, look for the **43 Vendor Specific Info** check box, and then select it.

5 Under **Data Entry**, highlight the existing values, and then press **<Delete>** on your keyboard.

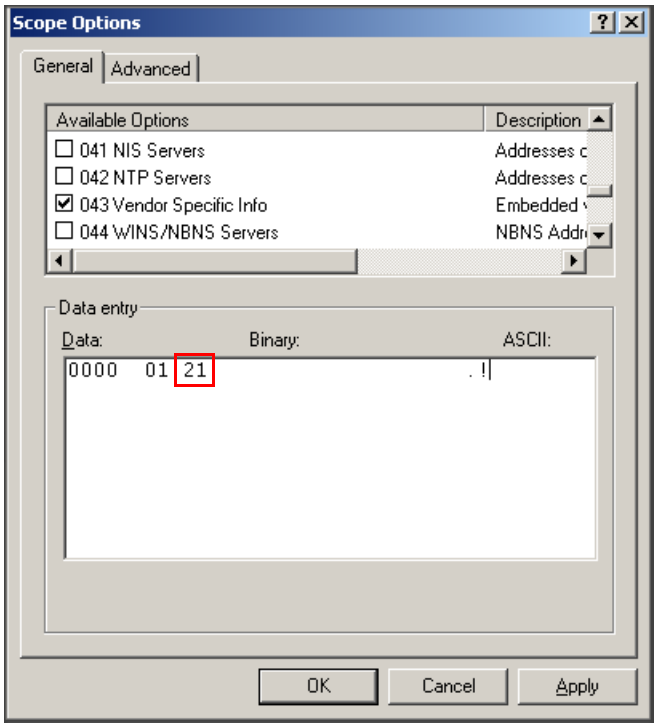
6 Position the cursor in the **Binary** text area, and then type **01**, the subcode for FlexMaster.

FIGURE 1-4: Type 01, the subcode for FlexMaster



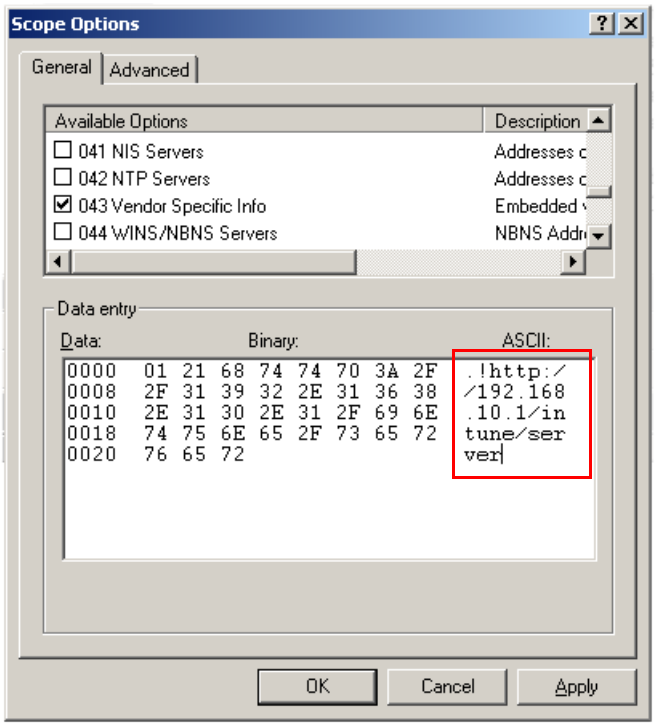
7 Under the **Binary** text area, position the cursor after the 01 subcode, and then type **21** – the hexadecimal equivalent of the FlexMaster server URL length that is used as example in this procedure.

FIGURE 1-5: After the 01 subcode for FlexMaster, type 21 – the hexadecimal equivalent of the FlexMaster server URL length



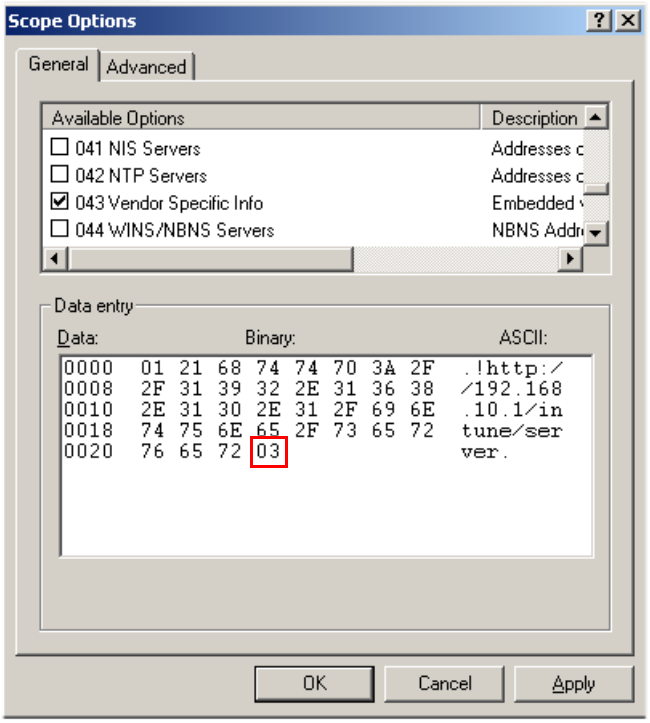
8 Position the cursor under the ASCII text area, and then type the FlexMaster server URL. In the example below, the FlexMaster server URL is http://192.168.10.1/intune/server.

FIGURE 1-6: In the ASCII text area, type the FlexMaster server URL



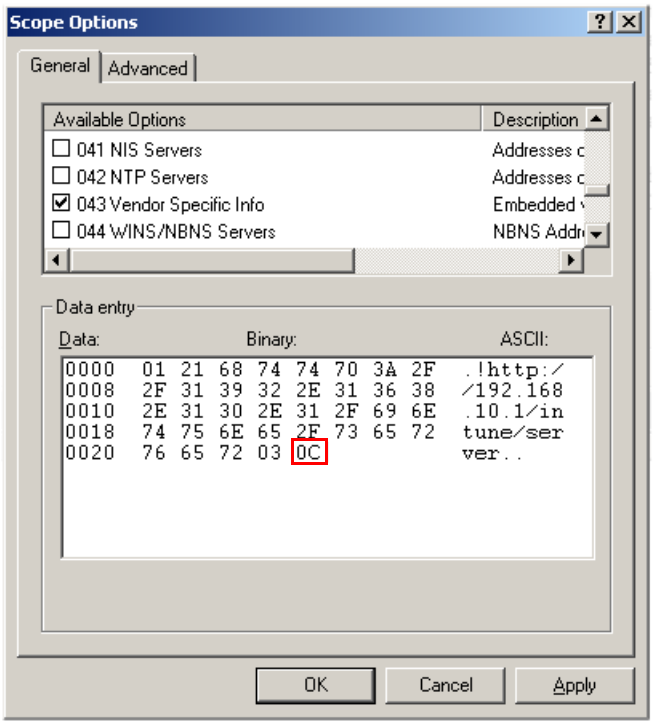
9 Position your cursor again after the last octet (in this example, **72**) under the **Binary** text area, and then type **03** (the subcode for ZoneDirector).

FIGURE 1-7Under the Binary text area, type 03 (the subcode for ZoneDirector)



10 After the ZoneDirector subcode (03), type the hexadecimal equivalent of the length of the ZoneDirector IP address length. For example, if the ZoneDirector IP address is `192.168.10.2`, the length in decimal is 12 and the hexadecimal equivalent is **0C**.

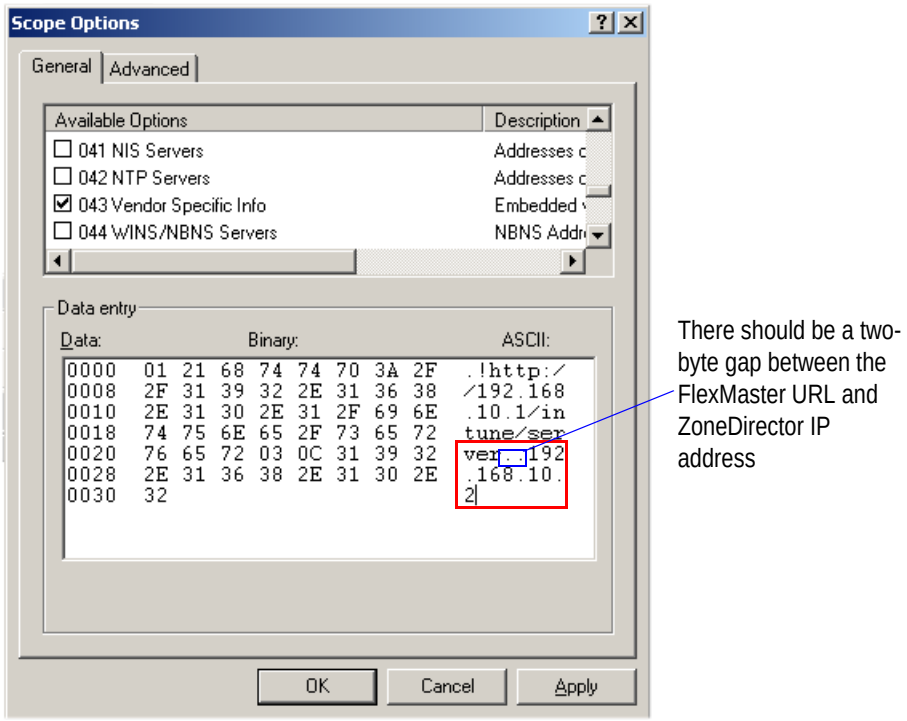
FIGURE 1-8: After the ZoneDirector subcode, type the hexadecimal equivalent of the ZoneDirector IP address length



11 Position the cursor under the **ASCII** text area after the FlexMaster server URL, and then type the ZoneDirector IP address. If you typed the hexadecimal equivalent of the ZoneDirector IP address, there should be two bytes

In the example below, the ZoneDirector IP address is `192.168.10.2`.

FIGURE 1-9: In the ASCII text area, type the ZoneDirector IP address (two bytes after the FlexMaster server URL)


Scope Options
General
Advanced
Available Options
Description
041 NIS Servers
042 NTP Servers
043 Vendor Specific Info
044 WINS/NBNS Servers
Data entry
Data:
Binary:
ASCII:
0000 01 21 68 74 74 70 3A 2F .!http:/
0008 2F 31 39 32 2E 31 36 38 /192.168
0010 2E 31 30 2E 31 2F 69 6E .10.1/in
0018 74 75 6E 65 2F 73 65 72 tune/ser
0020 76 65 72 03 0C 31 39 32 ver..192
0028 2E 31 36 38 2E 31 30 2E .168.10.
0030 32 2
OK
Cancel
Apply
There should be a two-byte gap between the FlexMaster URL and ZoneDirector IP address

12 Click **Apply** to save your changes.

13 Click **OK** to close the Scope Options dialog box.

You have completed configuring DHCP Option 43 to provide supported APs with the FlexMaster server URL and ZoneDirector IP address.

Option 3: Register ZoneDirector with a DNS Server

If you register ZoneDirector with your DNS server, supported APs that request for IP addresses from your DHCP server will also obtain DNS related information that will enable them to discover ZoneDirector devices on the network. Using the DNS information they obtained during the DHCP request, APs will attempt to resolve the ZoneDirector IP address (or IP addresses) using `zonedirector.{DNS domain name}`.

To register ZoneDirector devices with DNS server, perform the following tasks:

- *Step 1: Set the DNS Domain Name on the DHCP Server*
- *Step 2: Set the DNS Server IP Address on the DHCP Server*

- *Step 3: Register the ZoneDirector IP Addresses with a DNS Server*

NOTE	The following procedures describe how to customize a DHCP server running on Microsoft Windows Server. If your DHCP server is running on a different operating system, the procedure may be different.

Step 1: Set the DNS Domain Name on the DHCP Server

1 From Windows Administrative Tools, open **DHCP**, and then select the DHCP server that you want to configure.

2 If the **Scope** folder is collapsed, click the plus (+) sign to expand it.

3 Right-click **Scope Options**, and then click **Configure Options**. The **General** tab of the Scope Options dialog box appears.

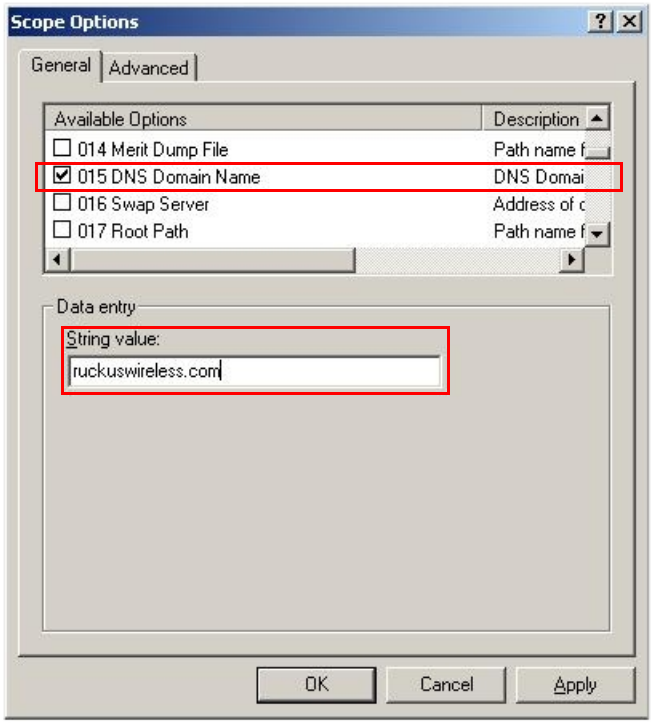
4 Under **Available Options**, look for the **15 DNS Domain Name** check box, and then select it.

5 In the **String value** text box under **Data Entry**, type your company's domain name.

6 Click **Apply** to save your changes.

7 Click **OK** to close the Scope Options dialog box.

FIGURE 1-10: Select the 015 DNS Domain Name check box, and then type your company domain name in String value



Step 2: Set the DNS Server IP Address on the DHCP Server

1 From Windows Administrative Tools, open **DHCP**, and then select the DHCP server you want to configure.

2 If the **Scope** folder is collapsed, click the plus (+) sign to expand it.

3 Right-click **Scope Options**, and then click **Configure Options**. The **General** tab of the Scope Options dialog box appears.

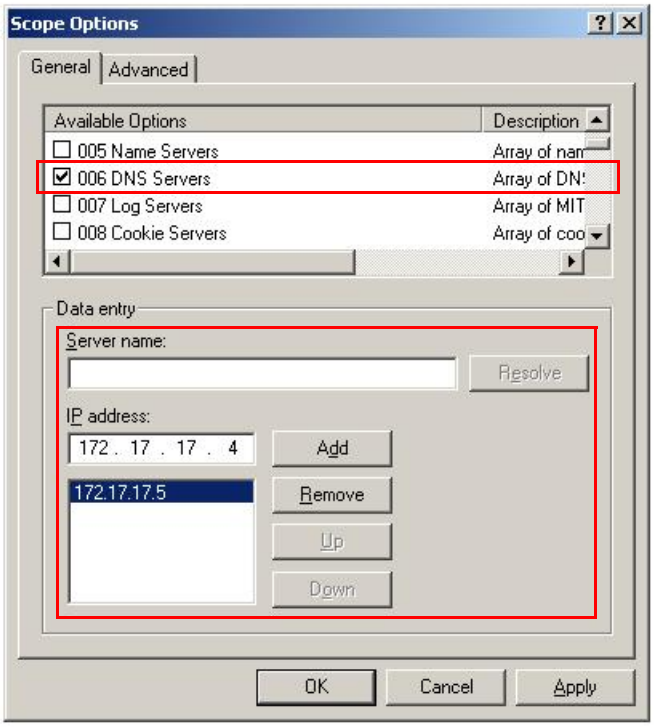
4 Under **Available Options**, look for the **6 DNS Servers** check box, and then select it.

5 In the **IP address** box under **Data Entry,** type your DNS server's IP address, and then click **Add**. If you have multiple DNS servers on the network, repeat the same procedure to add the other DNS servers.

6 Click **Apply** to save your changes.

7 Click **OK** to close the Scope Options dialog box.

FIGURE 1-11Select the 6 DNS Servers check box, and then type your DNS server's IP address in the Data entry section



Step 3: Register the ZoneDirector IP Addresses with a DNS Server

After you complete configuring the DHCP server with DNS related information, you need to register the IP addresses of ZoneDirector devices on the network with your DNS server. The procedure for this task depends on the DNS server software that you are using.

Information on configuring the built-in DNS server on Windows is available at http://support.microsoft.com/kb/814591.

IMPORTANT!	When your DNS server prompts you for the corresponding host name for each ZoneDirector IP address, you MUST enter `zonedirector`. This is critical to ensuring that the APs can resolve the ZoneDirector IP address.

After you register the ZoneDirector IP addresses with your DNS server, you have completed this procedure. APs on the network should now be able to discover ZoneDirector on another subnet.

Using the ZoneDirector Web Interface

The ZoneDirector administrative application is divided into five components that you can use to manage and monitor your Ruckus Wireless WLAN (including ZoneDirector and all APs).

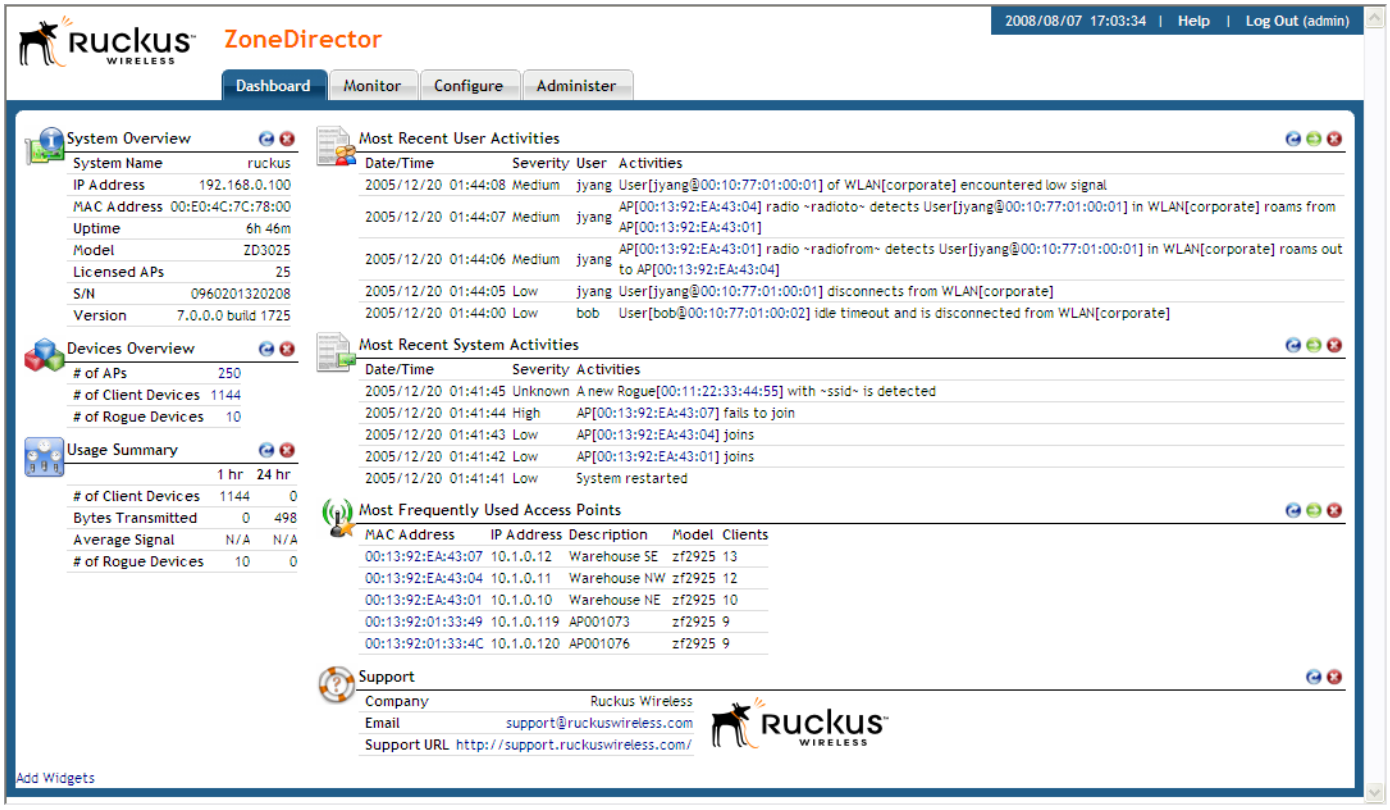
Dashboard	When you first log into your ZoneDirector with the Web interface, the Dashboard appears, displaying a number of widgets containing indicators and tables that summarize the network and its current status. Each indicator, gauge or table provides links to more focused, detailed views on elements of the network. TIP: You can minimize (hide) any of the tables or indicators on the Dashboard, then reopen them by means of the Add Widget options in the lower left corner.
Widgets	Widgets are Dashboard components, each containing a separate indicator or table as part of the active dashboard. Each widget can be added or removed to enhance your ZoneDirector Dashboard summary needs.
Tabs	Click any of the four tabs (Dashboard, Configure, Monitor, and Administer) to take advantage of related collections of features and options. When you click a tab, ZoneDirector displays a collection of tab-specific buttons*. Each tab's buttons are a starting point for Ruckus Wireless network setup, management, and monitoring. Note: if you click any of the three tabs, the Dashboard becomes available as a fourth tab.
Buttons	The left-side column of buttons varies according to which tab has been clicked. The buttons provide features that assist you in managing and monitoring your network. Click a button to see related options in the workspace to the right.
Workspace	The large area to the right of the buttons will display specific sets of features and options, depending on which tab is open and which button was clicked.

[* = *Except for the Dashboard*.]

Navigating the Dashboard

The Dashboard offers a number of self-contained indicators and tables that summarize the network and its current status. Some indicators have values that link to more focused, detailed views on elements of the network.

FIGURE 1-12 The Dashboard


Ruckus WIRELESS
ZoneDirector
2008/08/07 17:03:34 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
System Overview
System Name ruckus
IP Address 192.168.0.100
MAC Address 00:E0:4C:7C:78:00
Uptime 6h 46m
Model ZD3025
Licensed APs 25
S/N 0960201320208
Version 7.0.0.0 build 1725
Devices Overview
# of APs 250
# of Client Devices 1144
# of Rogue Devices 10
Usage Summary
1 hr 24 hr
# of Client Devices 1144 0
Bytes Transmitted 0 498
Average Signal N/A N/A
# of Rogue Devices 10 0
Most Recent User Activities
Date/Time Severity User Activities
2005/12/20 01:44:08 Medium jyang User[jyang@00:10:77:01:00:01] of WLAN[corporate] encountered low signal
2005/12/20 01:44:07 Medium jyang AP[00:13:92:EA:43:04] radio ~radioto~ detects User[jyang@00:10:77:01:00:01] in WLAN[corporate] roams from AP[00:13:92:EA:43:01]
2005/12/20 01:44:06 Medium jyang AP[00:13:92:EA:43:01] radio ~radiofrom~ detects User[jyang@00:10:77:01:00:01] in WLAN[corporate] roams out to AP[00:13:92:EA:43:04]
2005/12/20 01:44:05 Low jyang User[jyang@00:10:77:01:00:01] disconnects from WLAN[corporate]
2005/12/20 01:44:00 Low bob User[bob@00:10:77:01:00:02] idle timeout and is disconnected from WLAN[corporate]
Most Recent System Activities
Date/Time Severity Activities
2005/12/20 01:41:45 Unknown A new Rogue[00:11:22:33:44:55] with ~ssid~ is detected
2005/12/20 01:41:44 High AP[00:13:92:EA:43:07] fails to join
2005/12/20 01:41:43 Low AP[00:13:92:EA:43:04] joins
2005/12/20 01:41:42 Low AP[00:13:92:EA:43:01] joins
2005/12/20 01:41:41 Low System restarted
Most Frequently Used Access Points
MAC Address IP Address Description Model Clients
00:13:92:EA:43:07 10.1.0.12 Warehouse SE zf2925 13
00:13:92:EA:43:04 10.1.0.11 Warehouse NW zf2925 12
00:13:92:EA:43:01 10.1.0.10 Warehouse NE zf2925 10
00:13:92:01:33:49 10.1.0.119 AP001073 zf2925 9
00:13:92:01:33:4C 10.1.0.120 AP001076 zf2925 9
Support
Company Ruckus Wireless
Email support@ruckuswireless.com
Support URL http://support.ruckuswireless.com/
Ruckus WIRELESS
Add Widgets

The following indicators are provided:

NOTE

Some indicators may not be present upon initial view. The Add Widgets feature, located at the bottom left area of the screen, enables you to show or hide indicators. See *"Using Indicator Widgets"* on page 19.

- **System Overview:** Shows ZoneDirector system information, including its IP address, MAC address, model number, maximum number of licensed APs, serial number, and software version number, among others.
- **Devices Overview:** Shows the number of APs being managed by ZoneDirector, as well as the number of clients connected to these managed APs. It also shows the number of rogue devices that have been detected by ZoneDirector.
- **Usage Summary:** Shows usage statistics for the last hour and the last 24 hours.
- **Most Active Client Devices:** Identifies the most active clients by MAC address, IP address, and user name. Bandwidth usage is calculated in megabytes (MB) and is based on the total number of bytes sent (Tx) and received (Rx) by each client from the time it associated with the managed AP.
- **Most Recent User Activities:** Shows activities performed by users on client machines.
- **Most Recent System Activities:** Shows system activities related to ZoneDirector operation.

- **Most Frequently Used Access Points:** Lists the access points that are serving the most client requests.
- **Currently Active WLANs:** Shows details of currently active ZoneDirector WLANs.
- **Currently Managed APs:** Shows details of access points that ZoneDirector is currently managing.
- **Support:** Shows contact information for Ruckus Wireless support.

NOTE	You can sort the information (in ascending or descending order) that appears on the dashboard by clicking the column headers.

Using Indicator Widgets

Dashboard widgets represent the indicators displayed as part of the active dashboard. Indicator widgets can be added or removed to enhance your ZoneDirector summary needs.

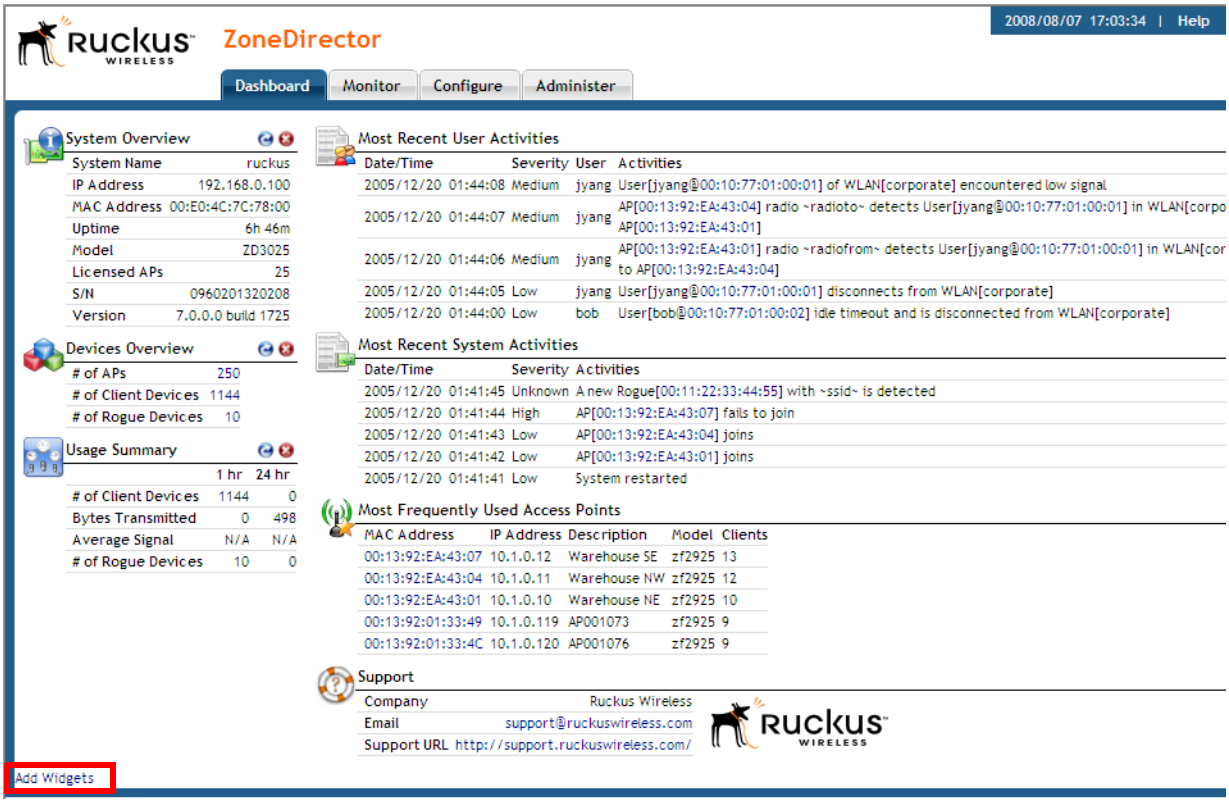
Adding a Widget

To add widgets:

1 Go to the Dashboard.

2 Click **Add Widgets** from the bottom left of the *Dashboard* page.

FIGURE 1-13


Ruckus WIRELESS
ZoneDirector
2008/08/07 17:03:34 | Help
Dashboard
Monitor
Configure
Administer
System Overview
System Name ruckus
IP Address 192.168.0.100
MAC Address 00:E0:4C:7C:78:00
Uptime 6h 46m
Model ZD3025
Licensed APs 25
S/N 0960201320208
Version 7.0.0.0 build 1725
Devices Overview
# of APs 250
# of Client Devices 1144
# of Rogue Devices 10
Usage Summary
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# of Rogue Devices 10 0
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Date/Time Severity User Activities
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2005/12/20 01:44:07 Medium jyang AP[00:13:92:EA:43:04] radio ~radioto~ detects User[jyang@00:10:77:01:00:01] in WLAN[corpo
AP[00:13:92:EA:43:01]
2005/12/20 01:44:06 Medium jyang AP[00:13:92:EA:43:01] radio ~radiofrom~ detects User[jyang@00:10:77:01:00:01] in WLAN[cor
to AP[00:13:92:EA:43:04]
2005/12/20 01:44:05 Low jyang User[jyang@00:10:77:01:00:01] disconnects from WLAN[corporate]
2005/12/20 01:44:00 Low bob User[bob@00:10:77:01:00:02] idle timeout and is disconnected from WLAN[corporate]
Most Recent System Activities
Date/Time Severity Activities
2005/12/20 01:41:45 Unknown A new Rogue[00:11:22:33:44:55] with ~ssid~ is detected
2005/12/20 01:41:44 High AP[00:13:92:EA:43:07] fails to join
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2005/12/20 01:41:42 Low AP[00:13:92:EA:43:01] joins
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Most Frequently Used Access Points
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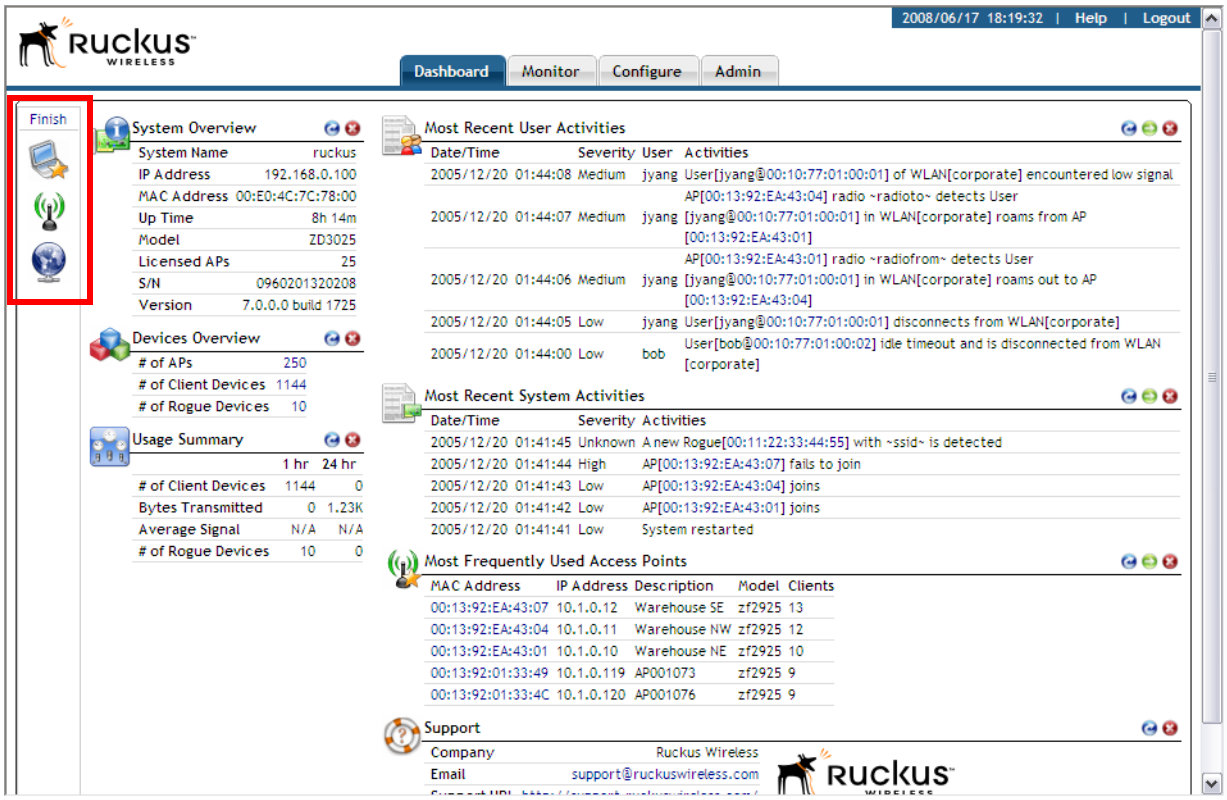
00:13:92:EA:43:07 10.1.0.12 Warehouse SE zf2925 13
00:13:92:EA:43:04 10.1.0.11 Warehouse NW zf2925 12
00:13:92:EA:43:01 10.1.0.10 Warehouse NE zf2925 10
00:13:92:01:33:49 10.1.0.119 AP001073 zf2925 9
00:13:92:01:33:4C 10.1.0.120 AP001076 zf2925 9
Support
Company Ruckus Wireless
Email support@ruckuswireless.com
Support URL http://support.ruckuswireless.com/
Ruckus WIRELESS
Add Widgets

The Widgets pane opens on the bottom left side of the Dashboard.

3 Select any Widget icon and drag and drop it onto the Dashboard to add the widget. If you have closed a widget, it appears in this pane.

FIGURE 1-14


2008/06/17 18:19:32 | Help | Logout
Dashboard
Monitor
Configure
Admin
Finish
System Overview
System Name ruckus
IP Address 192.168.0.100
MAC Address 00:E0:4C:7C:78:00
Up Time 8h 14m
Model ZD3025
Licensed APs 25
S/N 0960201320208
Version 7.0.0.0 build 1725
Devices Overview
# of APs 250
# of Client Devices 1144
# of Rogue Devices 10
Usage Summary
1 hr 24 hr
# of Client Devices 1144 0
Bytes Transmitted 0 1.23K
Average Signal N/A N/A
# of Rogue Devices 10 0
Most Recent User Activities
Date/Time Severity User Activities
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2005/12/20 01:44:00 Low bob User[bob@00:10:77:01:00:02] idle timeout and is disconnected from WLAN [corporate]
Most Recent System Activities
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2005/12/20 01:41:45 Unknown A new Rogue[00:11:22:33:44:55] with ~ssid~ is detected
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2005/12/20 01:41:42 Low AP[00:13:92:EA:43:01] joins
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00:13:92:EA:43:04 10.1.0.11 Warehouse NW zf2925 12
00:13:92:EA:43:01 10.1.0.10 Warehouse NE zf2925 10
00:13:92:01:33:49 10.1.0.119 AP001073 zf2925 9
00:13:92:01:33:4C 10.1.0.120 AP001076 zf2925 9
Support
Company Ruckus Wireless
Email support@ruckuswireless.com
Ruckus

4 Click **Finish** in the Widgets pane to close it.

Removing a Widget

To remove an indicator widget, click the red x icon for any of the indicator widgets presently open on the Dashboard.

About Ruckus Wireless WLAN Security

After your initial setup, your Ruckus wireless network connects all authorized users by default to your internal WLAN. This WPA-based WLAN is configured to provide secure coverage for all authorized users. (A companion “guest” WLAN provides cleartext but controlled access for guest users.) But Ruckus offers other security options that can be applied to the internal WLAN through ZoneDirector. These options range from a less-secure WEP key-based configuration, through the default WPA passphrase-based configuration to a higher-security, certificate-based 802.1x EAP configuration. Your choice mostly depends on what kinds of client authentication your users' client devices support.

For example, some of your WLAN users may be limited to a WEP-based security system by their client devices (computer or wireless network adapter). With the Web interface, you do have options: You can change the existing internal configuration from WPA to the less-secure WEP, or add a custom WLAN with WEP options for those users who require WEP, while retaining the original, more secure internal WPA configuration for the rest of your users. Or, you can replace the default WPA setup with a secure authentication/encryption methodology, 802.1x EAP.

One drawback to 802.1x is the more labor-intensive setup, requiring (among other tasks) the transfer of root certificate copies to your users, who must then import the certificates into their client devices. This will prove disruptive if you have a large user audience already using your network.

ZoneDirector supports one or more WLANs, and if you need to add a WEP WLAN for those users, in addition to your WPA internal WLAN, you can easily do so. User could utilize the Zero-IT Activation to obtain the WEP key automatically or could manually enter the WEP key in their client device wireless configuration.

If you like the security of the default configuration, you can take advantage of customizable options that have no disruptive effect on your current users' connections.

All three basic options (WEP, WPA and 802.1x) are detailed in *"Creating a New WLAN"* on page 46, and you can learn how to apply them to your Ruckus WLAN in the same section.

Controlling Device Permissions: Blocking and ACLs

ZoneDirector features a block list as well as access control list (ACL) functionality to control network permissions.

- **Block List**: When users log into a ZoneDirector network, their client devices (for example, laptop computers and PCs) are recorded and tracked. If, for any reason, you need to block a client device from network use, you can do via the ZoneDirector Web interface. For more on configuring the block list, see *"Blocking Client Devices"* on page 58.
- **ACLs**: Access control lists establish which devices based on their MAC addresses are allowed to associate to a ZoneDirector-managed AP. By using the **Configuration > Access Control** options, you define Layer 2 ACLs, also known as MAC address ACLs, which can then be applied to one or more ZoneDirector WLANs. ACLs are either allow-only or deny-only; that is, an ACL can be set up to allow only specified clients or to deny only specified clients. For more on configuring ACLs, see *"Configuring Access Control Lists"* on page 44.

Note the following ZoneDirector rules:

- The block list is system-wide and is applied to all WLANs in addition to the per-WLAN ACL. If a MAC address is listed in the system-wide block list, it will be blocked even if it is an allowed entry in an ACL. Thus, the block list takes precedence over an ACL.
- MAC addresses that are in the deny list are blocked at the AP, not at ZoneDirector.

CHAPTER 2

Configuring System Settings

Chapter Contents

- *"Changing the Network Addressing"* 23
- *"Changing the System Name"* 24
- *"Updating the Internal Clock"* 27
- *"Changing the System Log Settings"* 28
- *"Setting Up Email Alarm Notification"* 31
- *"Customizing the Guest Login Page"* 32
- *"Upgrading ZoneDirector and ZoneFlex APs"* 34
- *"Working with Backup Files"* 35
- *"Restoring ZoneDirector to Default Factory Settings"* 36
- *"Enabling Management via FlexMaster"* 37

Changing the Network Addressing

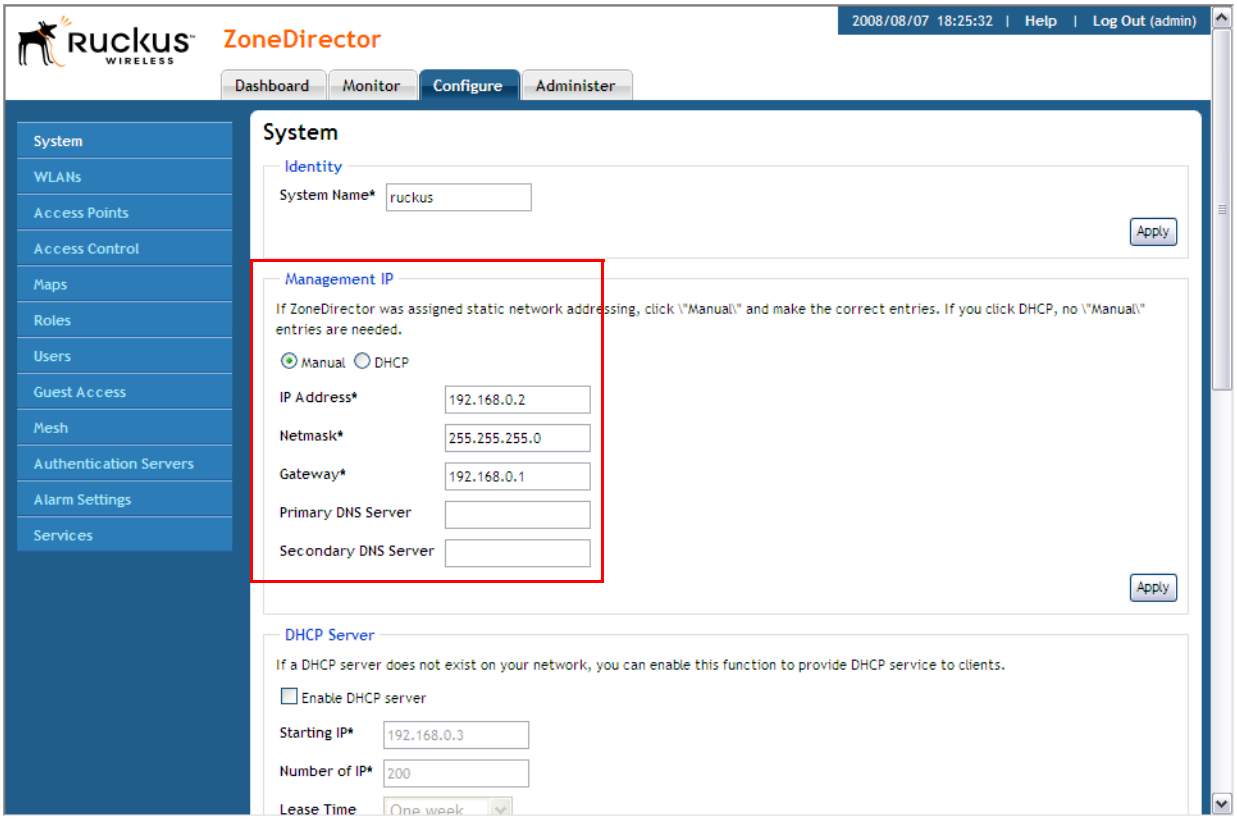
If you need to replace or update the network settings of ZoneDirector, follow these steps.

ALERT! As soon as the IP address has been changed (applied), you will be disconnected from your Web interface connection to ZoneDirector. You can log into the Web interface again by using the new IP address in your Web browser.

1 Go to **Configure** > **System**.

2 Review the *Management IP* options.

FIGURE 2-1: The Management IP options



3 Select one of the following:

- **Manual**: If you select Manual, enter the correct information in the now-active fields (IP Address, Netmask, and Gateway are required).
- **DHCP**: If you select DHCP, no further information is required.

4 Click **Apply** to save your settings.

You will lose connection to ZoneDirector.

5 To log back into the Web interface, use the newly assigned IP address in your Web browser or use the UPnP application to rediscover ZoneDirector.

Changing the System Name

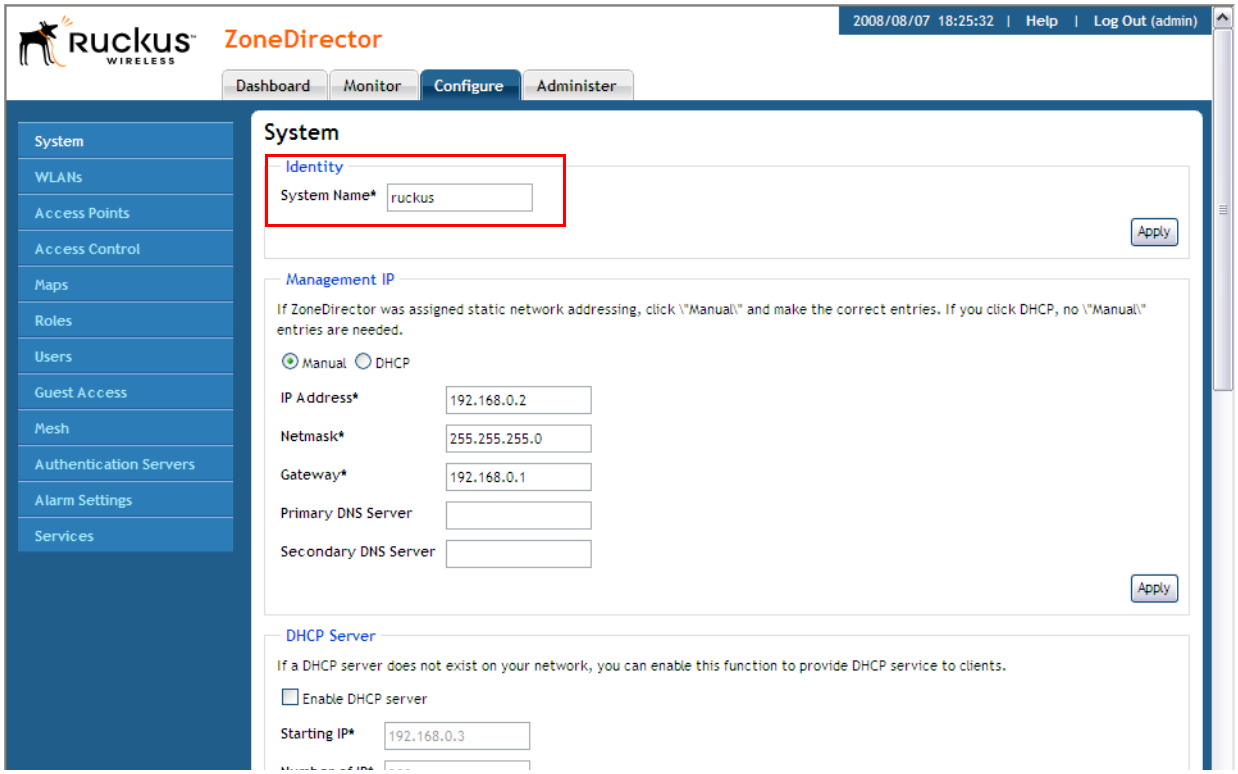
When you first worked through the Setup Wizard, you were prompted for a network-recognizable system name for ZoneDirector. If needed, you can change that name by following these steps:

1 Go to **Configure** > **System**.

2 In **System Name** (under *Identity)*, delete the text, and then type a new name.

The name should be between 6 and 32 characters in length, using letters, numbers, underscores (_) and hyphens (-). Do not use spaces or other special characters.

FIGURE 2-2: The Identity section on the System page



3 Click **Apply** to save your settings. The change goes into effect immediately.

Configuring the Built-in DHCP Server

ZoneDirector comes with a built-in DHCP server that you can enable to assign IP addresses to devices that are connected to it. Note that before you can enable the built-in DHCP server, ZoneDirector must be assigned a manual (or static) IP address. If you configured ZoneDirector to obtain IP address from another DHCP server on the network, the options for the built-in DHCP server will not be visible on the System page.

Enabling the Built-in DHCP server

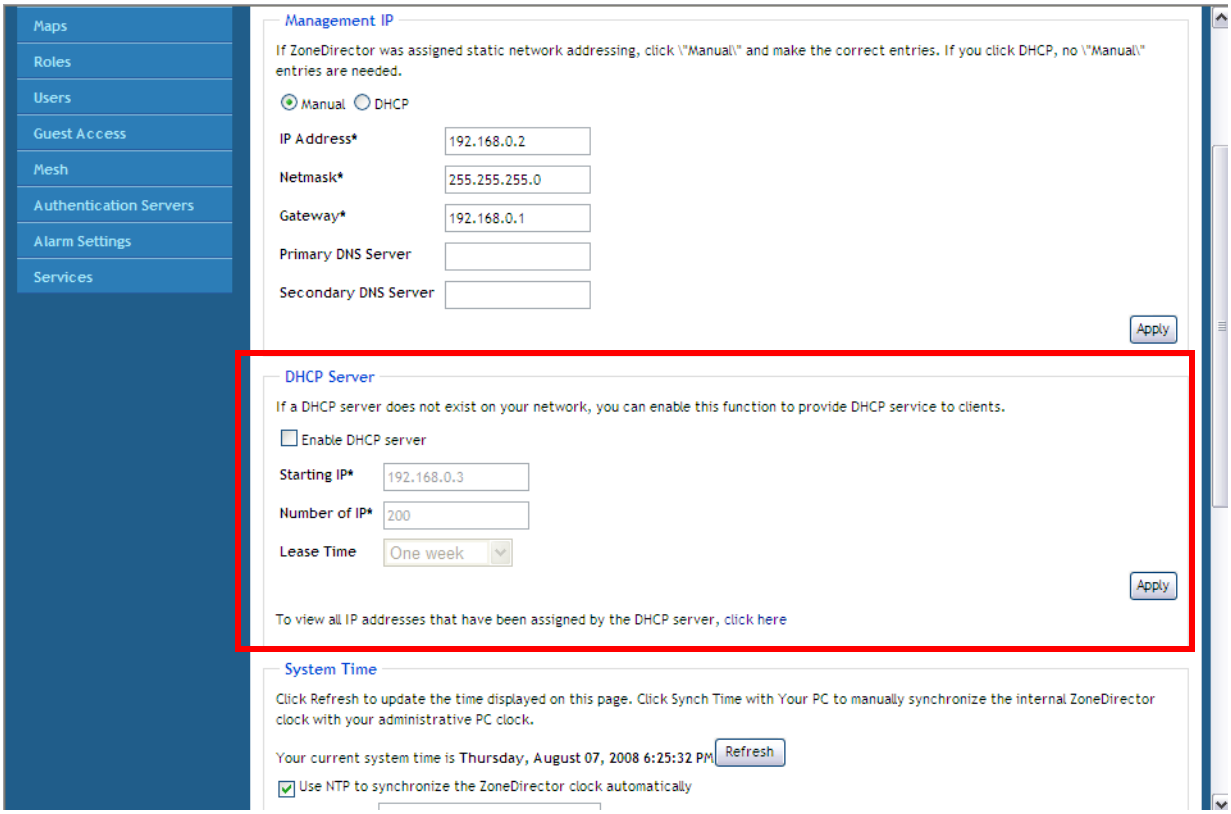
NOTE	Ruckus Wireless recommends that you only enable the built-in DHCP server if there are no other DHCP servers on the network. Note that the DHCP server in ZoneDirector can support only a single subnet. If you enable the built-in DHCP server, Ruckus Wireless also recommends enabling the rogue DHCP server detector. For more information, refer to *"Detecting Rogue DHCP Servers"* on page 98.

1. Click the **Configure** tab. The **System** page appears.
2. Under the **DHCP Server** section, select the **Enable DHCP** check box.
3. In **Starting IP Address**, type the first IP address that the built-in DHCP server will allocate to DHCP clients.

   Note that the starting IP address must be on the same subnet as the IP address assigned to ZoneDirector. If the value that you typed is invalid, an error message appears and prompts you if you want ZoneDirector to correct the value. Click **OK** to automatically correct the entry.
4. In **Number of IP**, type the maximum number of IP addresses that you want to allocate to requesting clients. The built-in DHCP server can allocate up to 255 IP addresses, including the one assigned to ZoneDirector. The default value is 200.
5. In **Lease Time**, select a time period during IP addresses will be allocated to DHCP clients. Options range from six hours to two weeks (default is one week).
6. Click **Apply**.

NOTE	If you typed an invalid value in any of the text boxes, an error message appears and prompts you if you want ZoneDirector to automatically correct the value. Click OK to change it to a correct value.

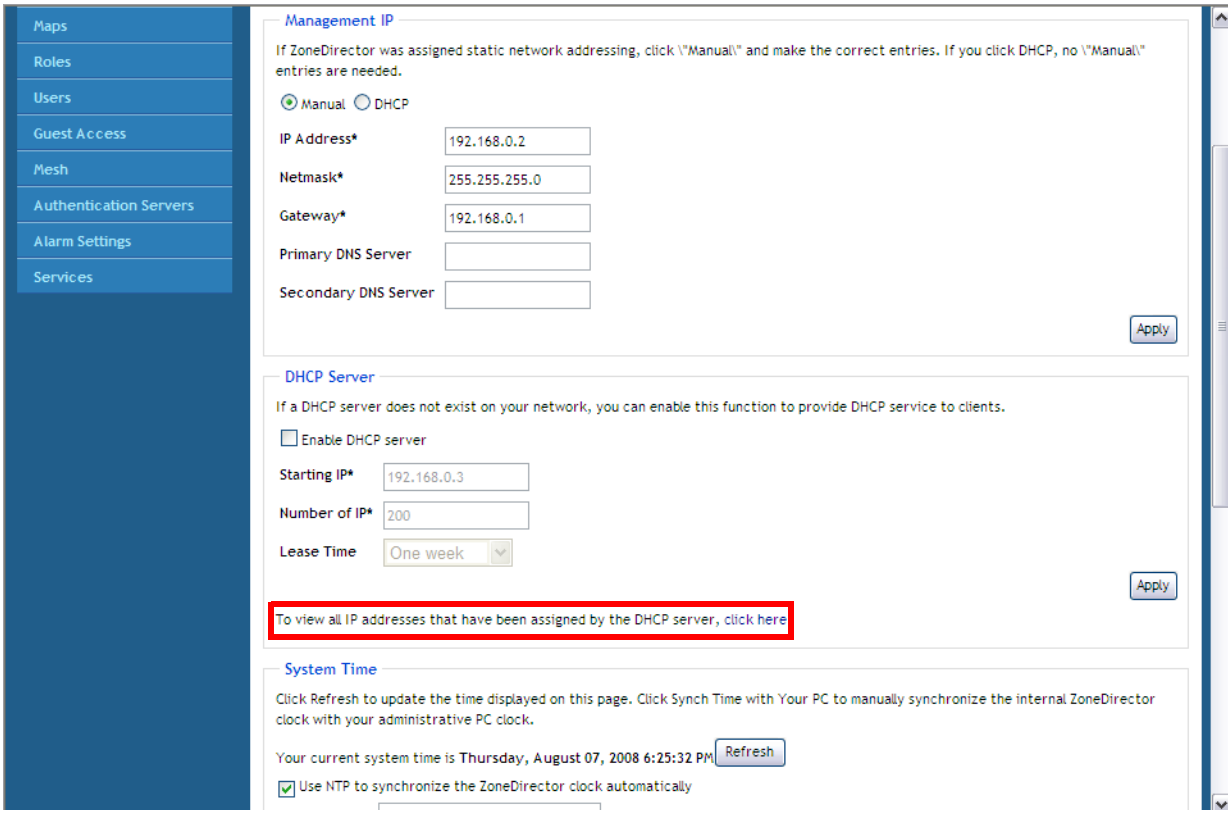
FIGURE 2-3: The DHCP Server options


Maps
Roles
Users
Guest Access
Mesh
Authentication Servers
Alarm Settings
Services
Management IP
If ZoneDirector was assigned static network addressing, click \"Manual\" and make the correct entries. If you click DHCP, no \"Manual\" entries are needed.
Manual
DHCP
IP Address*
192.168.0.2
Netmask*
255.255.255.0
Gateway*
192.168.0.1
Primary DNS Server
Secondary DNS Server
Apply
DHCP Server
If a DHCP server does not exist on your network, you can enable this function to provide DHCP service to clients.
Enable DHCP server
Starting IP*
192.168.0.3
Number of IP*
200
Lease Time
One week
Apply
To view all IP addresses that have been assigned by the DHCP server, click here
System Time
Click Refresh to update the time displayed on this page. Click Synch Time with Your PC to manually synchronize the internal ZoneDirector clock with your administrative PC clock.
Your current system time is Thursday, August 07, 2008 6:25:32 PM
Refresh
Use NTP to synchronize the ZoneDirector clock automatically

Viewing DHCP Clients

To view a list of current DHCP clients, click the **click here** link at the end of the "**To see all currently assigned IPs by DHCP server…"** sentence. A table appears and lists all current DHCP clients with their MAC address, assigned IP address, and the remaining lease time.

FIGURE 2-4: To view current DHCP clients, click the "click here" link


Maps
Roles
Users
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Mesh
Authentication Servers
Alarm Settings
Services
Management IP
If ZoneDirector was assigned static network addressing, click \"Manual\" and make the correct entries. If you click DHCP, no \"Manual\" entries are needed.
Manual
DHCP
IP Address*
192.168.0.2
Netmask*
255.255.255.0
Gateway*
192.168.0.1
Primary DNS Server
Secondary DNS Server
Apply
DHCP Server
If a DHCP server does not exist on your network, you can enable this function to provide DHCP service to clients.
Enable DHCP server
Starting IP*
192.168.0.3
Number of IP*
200
Lease Time
One week
Apply
To view all IP addresses that have been assigned by the DHCP server, click here
System Time
Click Refresh to update the time displayed on this page. Click Synch Time with Your PC to manually synchronize the internal ZoneDirector clock with your administrative PC clock.
Your current system time is Thursday, August 07, 2008 6:25:32 PM
Refresh
Use NTP to synchronize the ZoneDirector clock automatically

Updating the Internal Clock

The internal clock in ZoneDirector is automatically synchronized with the clock on your administration PC during the initial setup. You can use the Web interface to check the current time on the internal clock, which shows up as a static notation in the Configure tab workspace. If this notation is incorrect, you can re-synchronize the internal clock to your PC clock immediately.

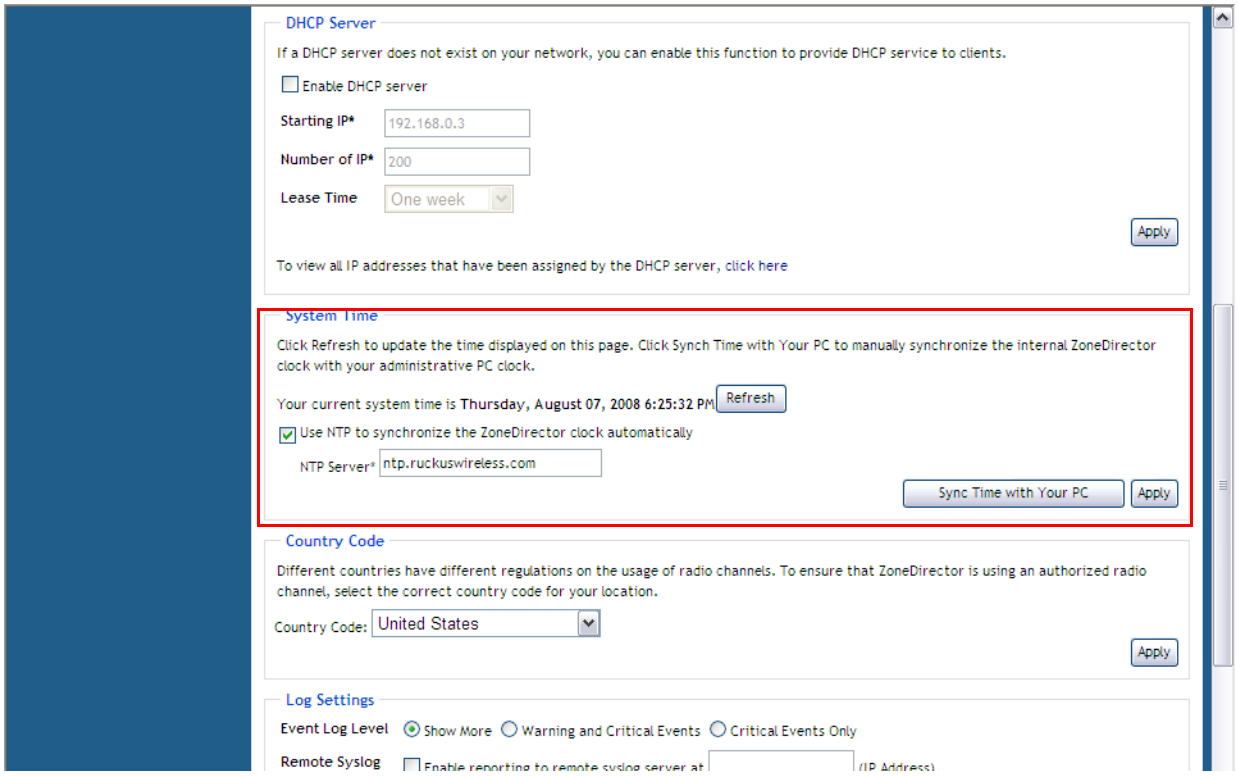
Another option is to link your ZoneDirector to an NTP server (as detailed below), which provides continual updating with the latest time.

1 Go to **Configure** > **System**.

2 In the *System Time* features you have the following options:

- **Refresh**: Click this to update the ZoneDirector display (a static snapshot) from the internal clock.
- **Synch Time with your PC Now**: If needed, click this to update the internal clock with the current time settings from your administration PC.
- **Use NTP...** (*Enabled by default*): Clear this check box to disable this option.

FIGURE 2-5: The System Time options


DHCP Server
If a DHCP server does not exist on your network, you can enable this function to provide DHCP service to clients.
Enable DHCP server
Starting IP*
192.168.0.3
Number of IP*
200
Lease Time
One week
Apply
To view all IP addresses that have been assigned by the DHCP server, click here
System Time
Click Refresh to update the time displayed on this page. Click Synch Time with Your PC to manually synchronize the internal ZoneDirector clock with your administrative PC clock.
Your current system time is Thursday, August 07, 2008 6:25:32 PM
Refresh
Use NTP to synchronize the ZoneDirector clock automatically
NTP Server*
ntp.ruckuswireless.com
Sync Time with Your PC
Apply
Country Code
Different countries have different regulations on the usage of radio channels. To ensure that ZoneDirector is using an authorized radio channel, select the correct country code for your location.
Country Code:
United States
Apply
Log Settings
Event Log Level
Show More
Warning and Critical Events
Critical Events Only
Remote Syslog

3 Click **Apply** to save the results of any resynchronization or NTP links.

Changing the System Log Settings

ZoneDirector maintains an internal log of current events and alarms. This file has a fixed capacity; at a certain level, ZoneDirector will start deleting the oldest entries to make room for the newest. This log is volatile, and the contents will be deleted if ZoneDirector is powered down. If you want a permanent record of all logging activities, you can set up your syslog server to receive log contents from ZoneDirector, and then use the Web interface to direct all logging to the syslog server—as detailed in this topic.

Reviewing the Current Log Contents

1 Go to **Monitor** > **All Events/Activities**.

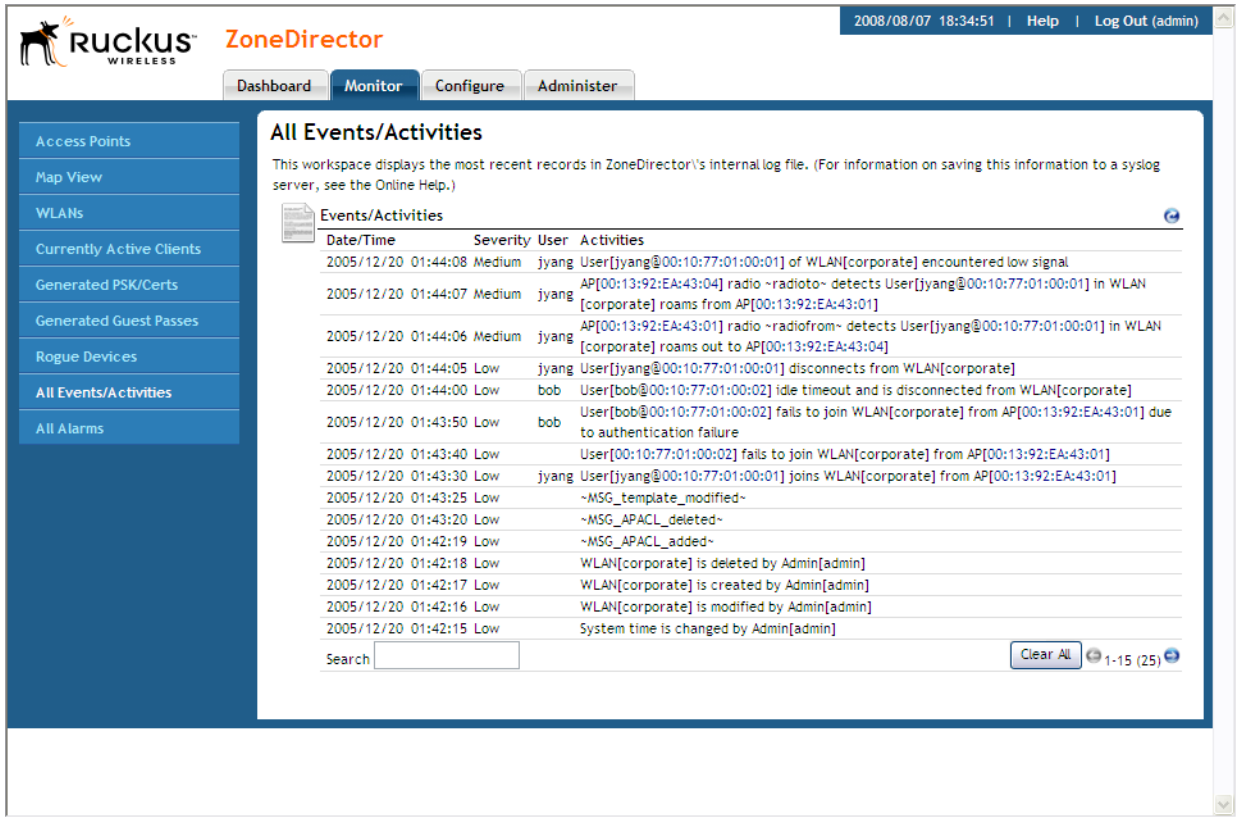
2 Review the events and alarms listed here. See “FIGURE 2-6” on page 29.

NOTE Log entries are listed in reverse chronological order (with the latest logs at the top of the list).

3 Click a column header to sort the contents by that category.

4 Click any column twice to switch chronological or alphanumeric sorting modes.

FIGURE 2-6: The All Events/Activities page


Ruckus WIRELESS
ZoneDirector
2008/08/07 18:34:51 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
Access Points
Map View
WLANs
Currently Active Clients
Generated PSK/Certs
Generated Guest Passes
Rogue Devices
All Events/Activities
All Alarms
All Events/Activities
This workspace displays the most recent records in ZoneDirector\'s internal log file. (For information on saving this information to a syslog server, see the Online Help.)
Events/Activities
Date/Time Severity User Activities
2005/12/20 01:44:08 Medium jyang User[jyang@00:10:77:01:00:01] of WLAN[corporate] encountered low signal
2005/12/20 01:44:07 Medium jyang AP[00:13:92:EA:43:04] radio ~radioto~ detects User[jyang@00:10:77:01:00:01] in WLAN [corporate] roams from AP[00:13:92:EA:43:01]
2005/12/20 01:44:06 Medium jyang AP[00:13:92:EA:43:01] radio ~radiofrom~ detects User[jyang@00:10:77:01:00:01] in WLAN [corporate] roams out to AP[00:13:92:EA:43:04]
2005/12/20 01:44:05 Low jyang User[jyang@00:10:77:01:00:01] disconnects from WLAN[corporate]
2005/12/20 01:44:00 Low bob User[bob@00:10:77:01:00:02] idle timeout and is disconnected from WLAN[corporate]
2005/12/20 01:43:50 Low bob User[bob@00:10:77:01:00:02] fails to join WLAN[corporate] from AP[00:13:92:EA:43:01] due to authentication failure
2005/12/20 01:43:40 Low User[00:10:77:01:00:02] fails to join WLAN[corporate] from AP[00:13:92:EA:43:01]
2005/12/20 01:43:30 Low jyang User[jyang@00:10:77:01:00:01] joins WLAN[corporate] from AP[00:13:92:EA:43:01]
2005/12/20 01:43:25 Low ~MSG_template_modified~
2005/12/20 01:43:20 Low ~MSG_APACL_deleted~
2005/12/20 01:42:19 Low ~MSG_APACL_added~
2005/12/20 01:42:18 Low WLAN[corporate] is deleted by Admin[admin]
2005/12/20 01:42:17 Low WLAN[corporate] is created by Admin[admin]
2005/12/20 01:42:16 Low WLAN[corporate] is modified by Admin[admin]
2005/12/20 01:42:15 Low System time is changed by Admin[admin]
Search
Clear All
1-15 (25)

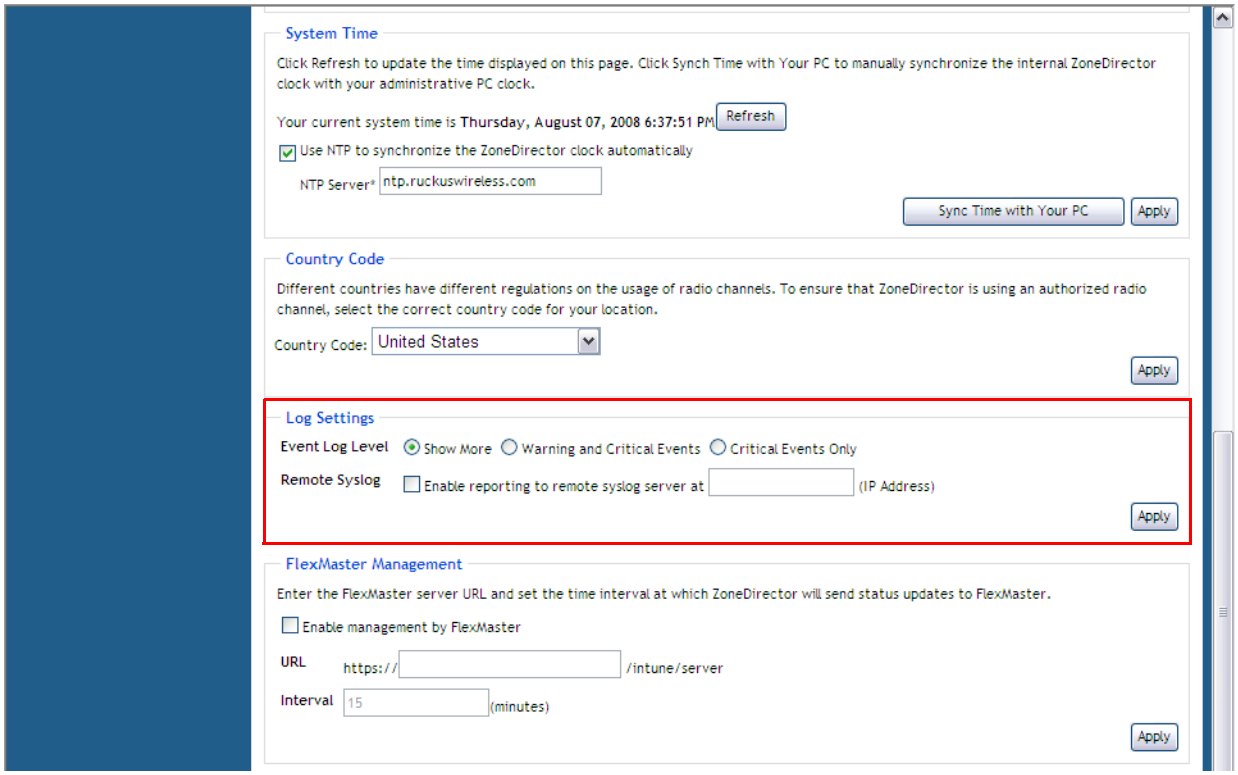
Checking the Current Log Settings

You can review and customize the log settings by following these steps:

1 Go to **Configure** > **System**.

2 Scroll down to *Log Settings*.

FIGURE 2-7: The Log Settings options


System Time
Click Refresh to update the time displayed on this page. Click Synch Time with Your PC to manually synchronize the internal ZoneDirector clock with your administrative PC clock.
Your current system time is Thursday, August 07, 2008 6:37:51 PM
Refresh
Use NTP to synchronize the ZoneDirector clock automatically
NTP Server* ntp.ruckuswireless.com
Sync Time with Your PC
Apply
Country Code
Different countries have different regulations on the usage of radio channels. To ensure that ZoneDirector is using an authorized radio channel, select the correct country code for your location.
Country Code: United States
Apply
Log Settings
Event Log Level
Show More
Warning and Critical Events
Critical Events Only
Remote Syslog
Enable reporting to remote syslog server at
(IP Address)
Apply
FlexMaster Management
Enter the FlexMaster server URL and set the time interval at which ZoneDirector will send status updates to FlexMaster.
Enable management by FlexMaster
URL
https://
/intune/server
Interval
15
(minutes)
Apply

3 Make your selections from these syslog server options:

Event Log Level	Select one of the three logging levels— “Show More”, “Warning and Critical Events”, or “Critical Events Only”.
Remote Syslog	To enable syslog logging, select the **Enable reporting to remote syslog server at** check box, and then type the IP address in the box provided.

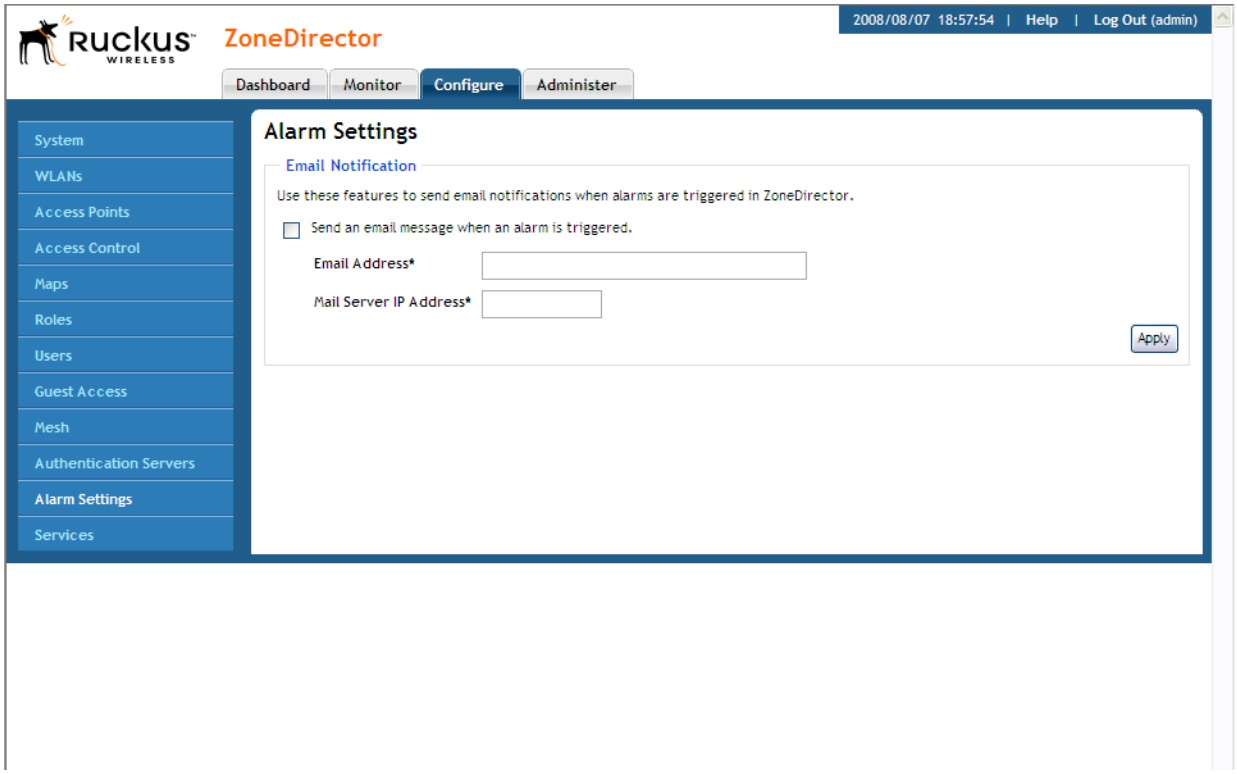
4 Click **Apply** to save your settings. The changes go into effect immediately.

Setting Up Email Alarm Notification

If an alarm condition is detected, ZoneDirector will record it in the event log. If you prefer, an email notification can be sent to a configured email address of your choosing. To enable this option, follow these steps:

1 Go to **Configure** > **Alarm Settings**. The *Email Notification* form appears.

FIGURE 2-8: The Alarm Settings page



2 To enable email notification, select the **Send an email message when an alarm is triggered** check box.

3 In **Email Address**, type the email address to which to send the alarm message.

4 In **Mail Server IP Address**, type the IP address of your mail server.

5 Click **Apply**. The email notification feature becomes active immediately.

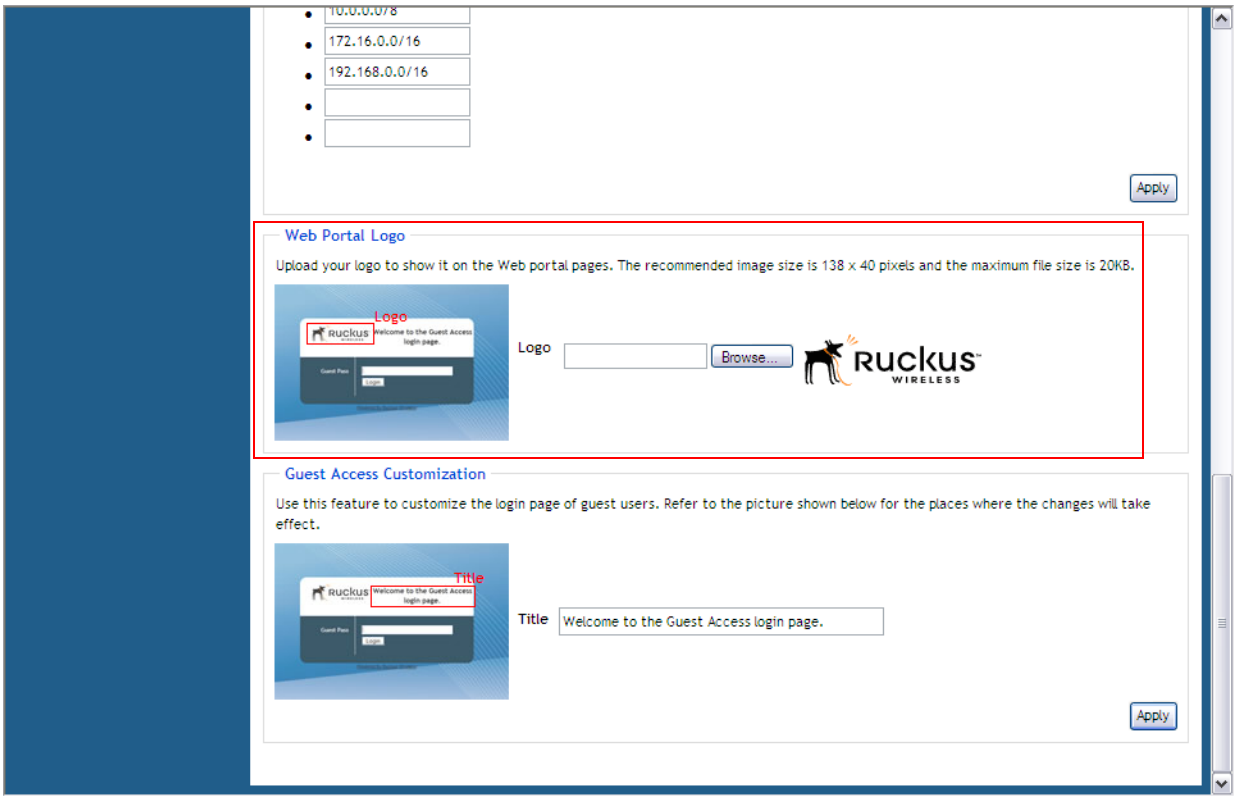
Customizing the Guest Login Page

You can customize the guest user login page, to display your corporate logo and to note helpful instructions, along with a “Welcome” title. If you want to include a logo, you'll need to prepare a Web-ready graphic file, in one of three acceptable formats (.JPG, .GIF or .PNG). Make sure the logo is no bigger than two inches long on any side, or larger than 200kB.

1 Go to **Configure** > **Guest Access**.

2 Locate the *Web Portal* Logo options.

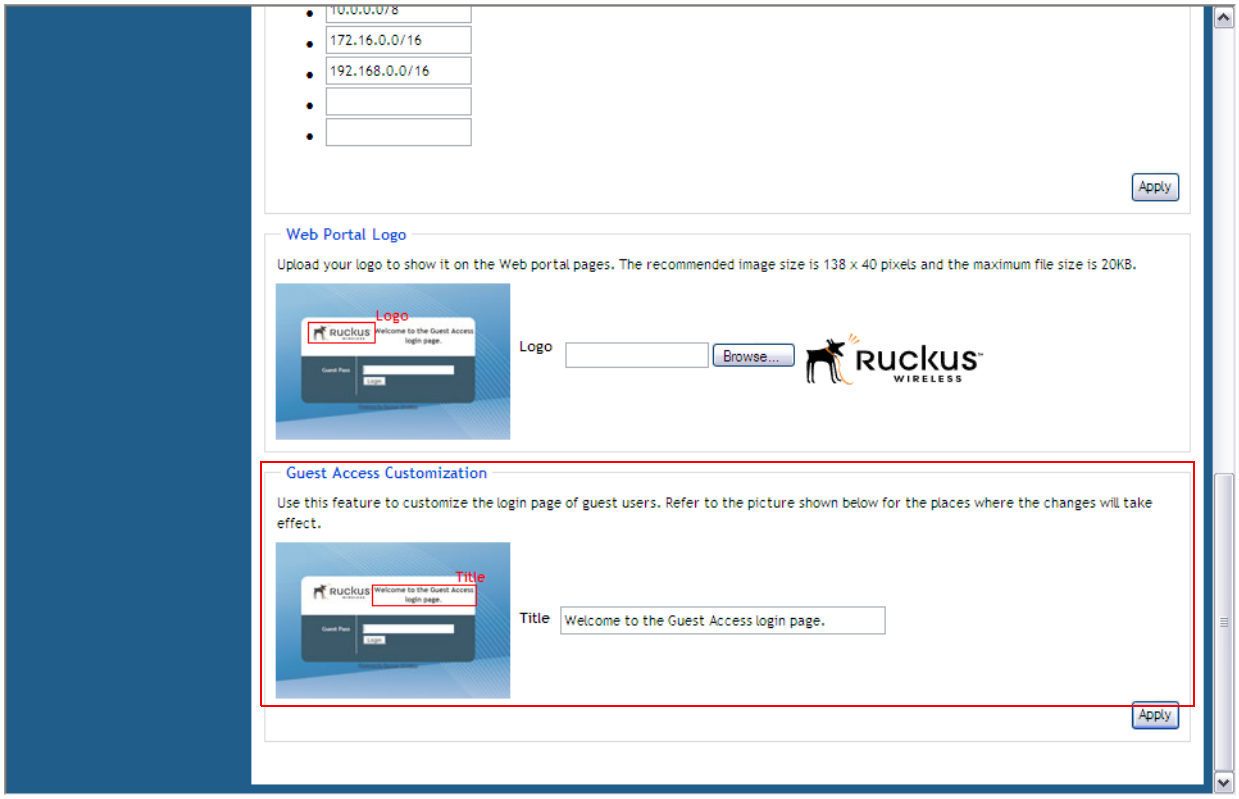
FIGURE 2-9: The Web Port Logo options


172.16.0.0/16
192.168.0.0/16
Apply
Web Portal Logo
Upload your logo to show it on the Web portal pages. The recommended image size is 138 x 40 pixels and the maximum file size is 20KB.
Logo
Logo
Browse...
Guest Access Customization
Use this feature to customize the login page of guest users. Refer to the picture shown below for the places where the changes will take effect.
Title
Title
Welcome to the Guest Access login page.
Apply

3 If your logo is ready for use, click **Browse** to open a dialog box that you can use to import the logo file. (ZoneDirector will notify you if the file is too large—height or width).

4 Locate the *Guest Access Customization* options.

FIGURE 2-10: The Guest Access Customization options


172.16.0.0/16
192.168.0.0/16
Apply
Web Portal Logo
Upload your logo to show it on the Web portal pages. The recommended image size is 138 x 40 pixels and the maximum file size is 20KB.
Logo
Logo
Browse...
Guest Access Customization
Use this feature to customize the login page of guest users. Refer to the picture shown below for the places where the changes will take effect.
Title
Title
Welcome to the Guest Access login page.
Apply

5 (Optional) Delete the text in the **Title** field and type a short descriptive title or "welcome" message.

6 Click **Apply** to save your settings. A "Setting applied!" confirmation message briefly appears.

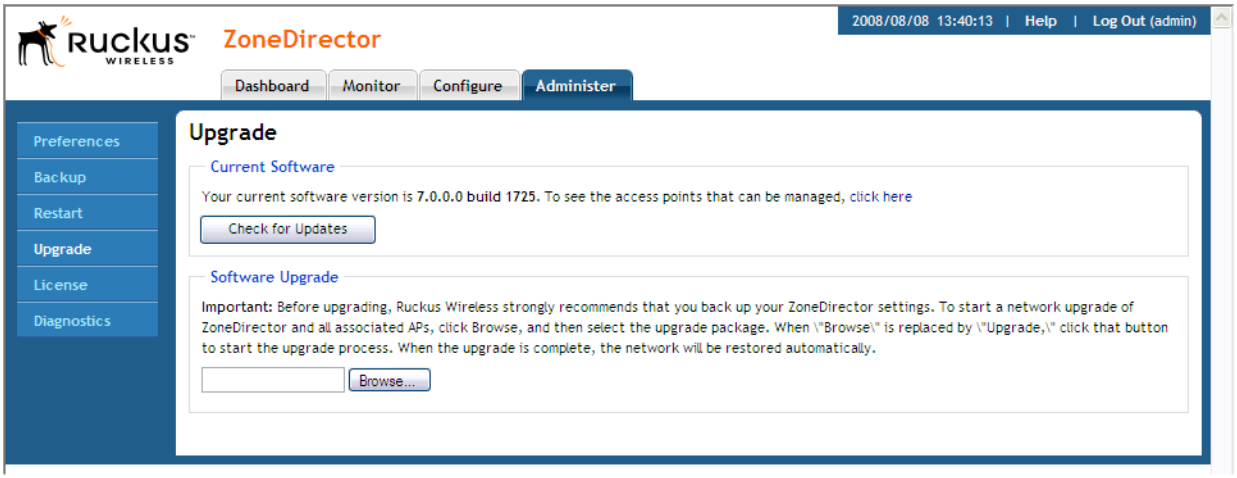
Upgrading ZoneDirector and ZoneFlex APs

Check the Ruckus Wireless Support Web site on a regular basis for updates that can be applied to your Ruckus Wireless network devices — to ZoneDirector and all your ZoneFlex APs. After downloading any update package to a convenient folder on your administrative PC, you can complete the network upgrade (of both ZoneDirector and APs) by following the steps detailed below.

NOTE Upgrading ZoneDirector and the APs will temporarily disconnect them (and any associated clients) from the network. To minimize network disruption, Ruckus Wireless recommends performing the upgrade procedure at an off-peak time.

1 Go to **Administer** > **Upgrade**.

FIGURE 2-11: The Upgrade page


Ruckus WIRELESS
ZoneDirector
2008/08/08 13:40:13 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
Preferences
Backup
Restart
Upgrade
License
Diagnostics
Upgrade
Current Software
Your current software version is 7.0.0.0 build 1725. To see the access points that can be managed, click here
Check for Updates
Software Upgrade
Important: Before upgrading, Ruckus Wireless strongly recommends that you back up your ZoneDirector settings. To start a network upgrade of ZoneDirector and all associated APs, click Browse, and then select the upgrade package. When \"Browse\" is replaced by \"Upgrade,\" click that button to start the upgrade process. When the upgrade is complete, the network will be restored automatically.
Browse...

2 Under the *Software Upgrade* section, click **Browse**. The Browse dialog box appears.

3 Browse to the location where you saved the upgrade package, and then click **Open**.

4 When the upgrade file name appears in the text field, the “Browse” button is transformed into the “Upgrade” button.

5 Click **Upgrade**.

ZoneDirector will automatically log you out of the Web interface, run the upgrade, and then restart itself. When the upgrade process is complete, the Status LED on ZoneDirector is steadily lit. You may now log back into the Web interface as Administrator.

NOTE The full network upgrade is successive in sequence. After ZoneDirector is upgraded, it will contact each active AP, upgrade it, and then restore it to service.

ALERT! The AP uses FTP to download firmware updates from ZoneDirector. If you have an access control list (ACL) or firewall between ZoneDirector and the AP, make sure that FTP traffic is allowed to ensure that the AP can successfully download the firmware update.

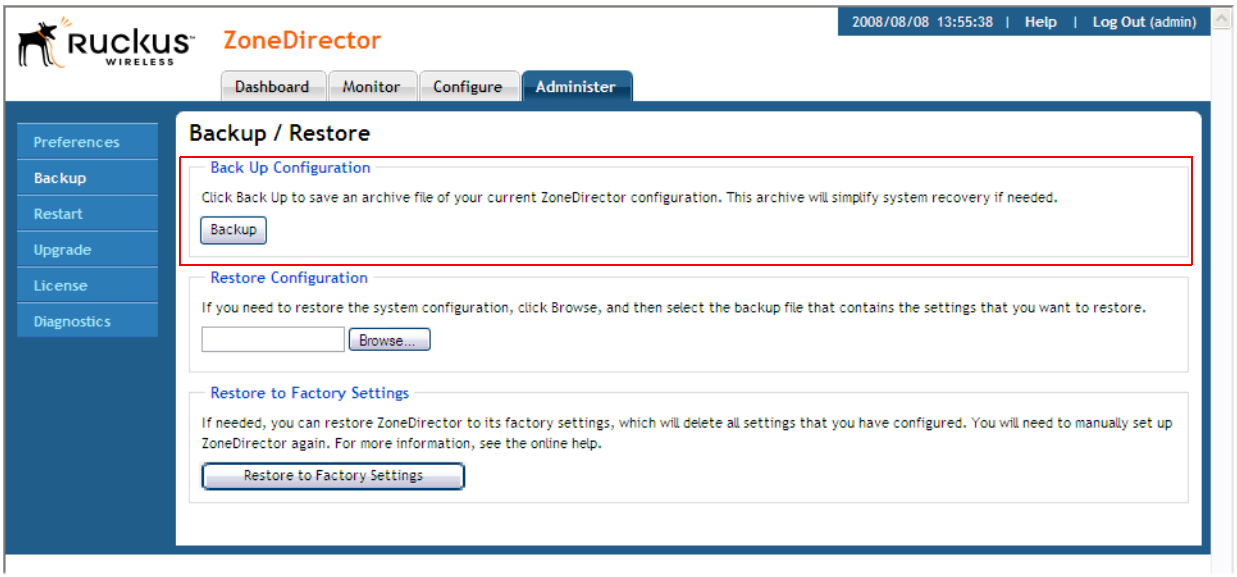
Working with Backup Files

After you have set up and configured your Ruckus wireless network, you may want to back up the full configuration. The resulting archive can be used to restore your ZoneDirector and network. And, whenever you make additions or changes to the setup, you can create new backup files at that time, too.

Backing Up a Network Configuration

1 Go to **Administer** > **Backup**.

FIGURE 2-12: The Back Up Configuration option


Ruckus WIRELESS
ZoneDirector
2008/08/08 13:55:38 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
Preferences
Backup
Restart
Upgrade
License
Diagnostics
Backup / Restore
Back Up Configuration
Click Back Up to save an archive file of your current ZoneDirector configuration. This archive will simplify system recovery if needed.
Backup
Restore Configuration
If you need to restore the system configuration, click Browse, and then select the backup file that contains the settings that you want to restore.
Browse...
Restore to Factory Settings
If needed, you can restore ZoneDirector to its factory settings, which will delete all settings that you have configured. You will need to manually set up ZoneDirector again. For more information, see the online help.
Restore to Factory Settings

2 Under the *Backup Configuration* sections, click **Back Up**. The *File Download* dialog box appears.

3 Click **Save**.

4 When the *Save As* dialog box appears, enter a name for this archive file, pick a destination folder, then click **Save**.

5 Make sure the filename ends in a ".TGZ" extension.

6 When the *Download Complete* dialog box appears, click **Close**.

Restoring Archived Settings to ZoneDirector

ALERT	Restoring a backup file will automatically reboot ZoneDirector and all APs that are currently associated with it. Users associated with these APs will be temporarily disconnected; wireless access will be restored automatically after ZoneDirector and the APs have completed booting up.

1 Go to **Administer** > **Backup**.

2 Review the **Restore Configuration** instructions, and then click **Browse**.

3 Use the **Browse** dialog box to locate the backup file.

4 Select the file, and then click **Open**. Three restore options appear:

- **Restore everything** - Select this option if you want the device to use all the settings configured in the backup file (including the IP address, wireless settings, and access control list, among others).
- **Restore everything except system name/IP address** - Select this option if you are deploying a second ZoneDirector for failover purposes.
- **Restore only configurations about WLANs, Access Controls, Roles, and Users** - Select this option if you want to use the backup file as a configuration template.

5 Click the **Restore** button.

ZoneDirector restores the backup file. During this process, ZoneDirector automatically logs you off the Web interface. When the restore process is complete, ZoneDirector automatically restarts and your wireless network will be ready for use again.

Restoring ZoneDirector to Default Factory Settings

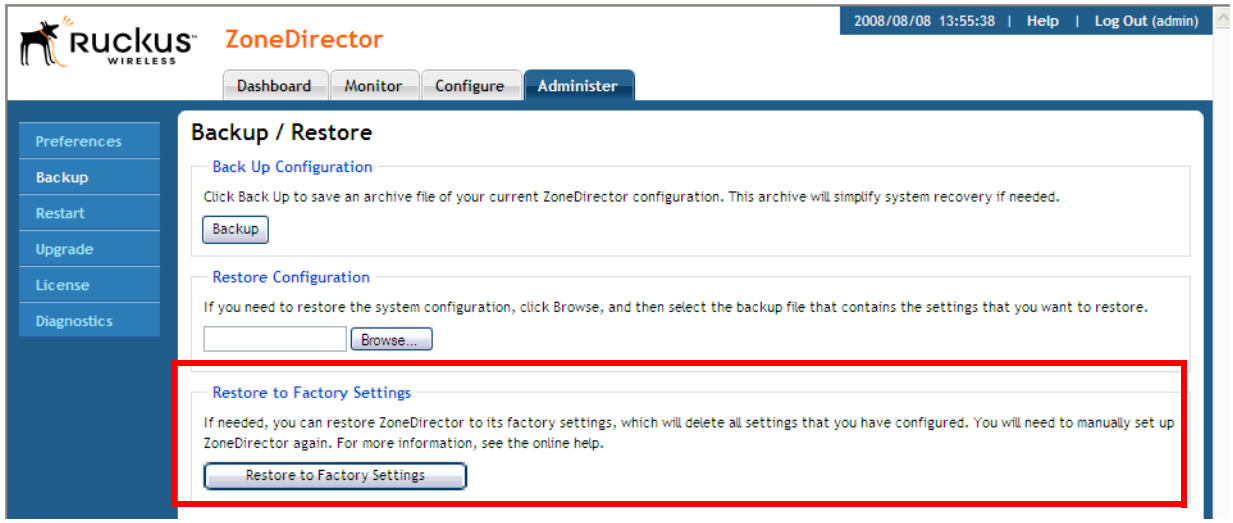
In certain extreme conditions, you may want to reinitialize ZoneDirector, and reset it to the "factory default" state. In such a state, the network is almost ready for use, but all your user/guest/log and other records, accounts and configurations would need to be manually reconfigured.

ALERT!	When this procedure is complete, you will need to redo a complete setup. If ZoneDirector is on a live network, a new IP address may be assigned to the system. In this case, the system can be discovered by a UPnP client application, such as Windows My Network Places. If there is no DHCP server on the connected network, the system's default IP address is "192.168.0.2" with subnet mask "255.255.255.0". A complete set of instructions is available in the Quick Start Guide (QSG). Before starting this "factory default settings" restoration, you should open and print out the QSG pages. You can follow those instructions to set up ZoneDirector after a factory-default state has been restored.

To reset your ZoneDirector to factory default settings, follow these steps:

1 Go to **Administer** > **Backup**.

FIGURE 2-13: The Res


Ruckus WIRELESS
ZoneDirector
2008/08/08 13:55:38 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
Preferences
Backup
Restart
Upgrade
License
Diagnostics
Backup / Restore
Back Up Configuration
Click Back Up to save an archive file of your current ZoneDirector configuration. This archive will simplify system recovery if needed.
Backup
Restore Configuration
If you need to restore the system configuration, click Browse, and then select the backup file that contains the settings that you want to restore.
Browse...
Restore to Factory Settings
If needed, you can restore ZoneDirector to its factory settings, which will delete all settings that you have configured. You will need to manually set up ZoneDirector again. For more information, see the online help.
Restore to Factory Settings

2 When the *Backup/Restore* page appears, look for **Restore to Factory Settings**, and click the button.

3 Owing to the drastic effect of this operation, one or more confirmation dialog boxes will appear. Click **OK** to confirm this operation.

When this process begins, you will be logged out of the Web interface.

When the reset is complete, the Status LED is a blinking red, then a blinking green, indicating that the system is in the "factory default" state. After you complete the Setup Wizard, the Status LED will be steady green.

Alternate Factory Default Reset Method

If you are unable to complete a software-based resetting of ZoneDirector, you can do the following "hard" restoration:

NOTE Do not disconnect ZoneDirector from any power source until this procedure is complete.

1 Look for a pinhole on the right side of the front panel of ZoneDirector.

2 Insert a straightened paper clip in the hole and press for at least 5 seconds.

After the reset is complete, the Status LED is a blinking red, then a blinking green, indicating that the system is in a "factory default" state.

After you complete the Setup Wizard, the Status LED will be steady green.

Enabling Management via FlexMaster

If you have a Ruckus Wireless FlexMaster server installed on the network, you can enable FlexMaster management to centralize monitoring and administration of ZoneDirector and other supported Ruckus Wireless devices. This version of ZoneDirector supports the following FlexMaster-deployed tasks:

- Firmware upgrade for both ZoneDirector and the APs that report to them
- Reboot
- Backup of ZoneDirector settings

When the FlexMaster management option is enabled, you will still be able to access the ZoneDirector Web interface to perform other management tasks. By default, FlexMaster management is disabled.

To enable FlexMaster management:

1 Click Configure > **System**.

1 Under FlexMaster Management (bottom of the page), select the **Enable management by FlexMaster** check box.

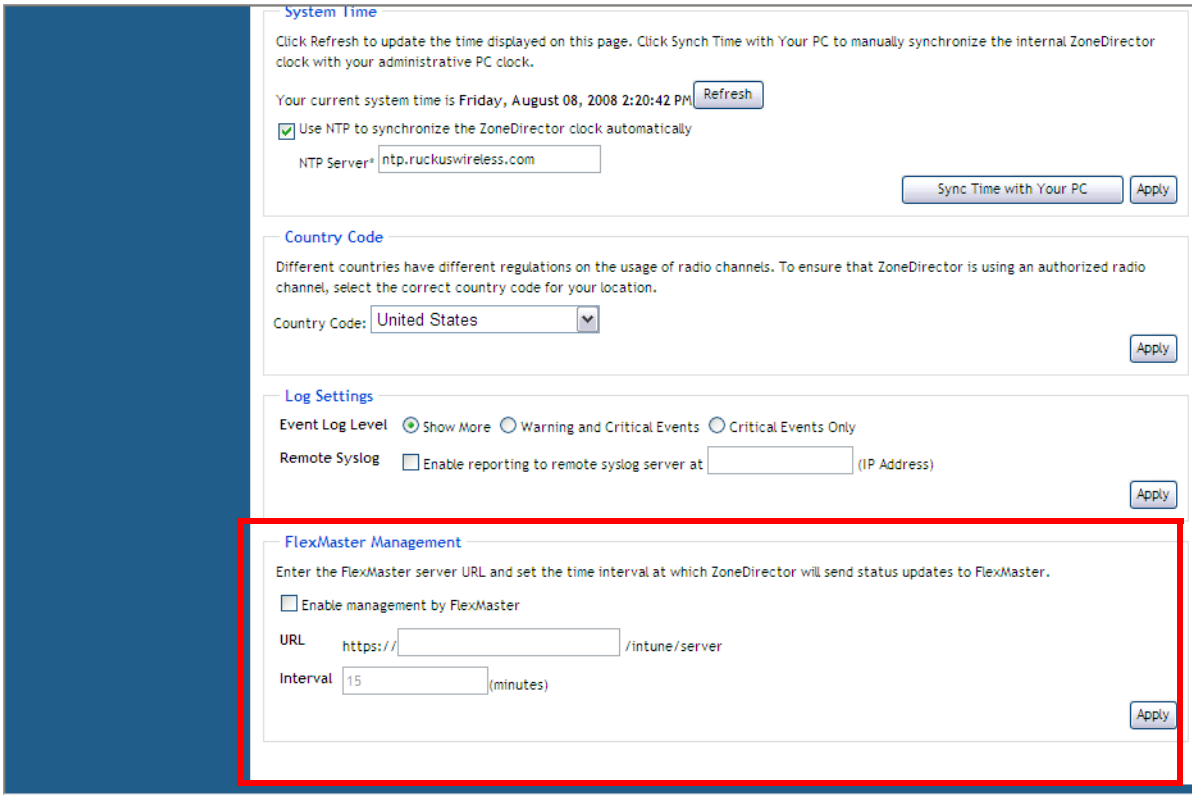
2 In **URL**, type the host name or IP address of the FlexMaster server.

3 In **Interval**, type the time interval (in minutes) at which ZoneDirector will send status updates to the FlexMaster server. The default interval is 15 minutes.

4 Click **Apply**. The message *Setting Applied* appears.

You have completed enabling FlexMaster management on ZoneDirector. For more information on how to configure ZoneDirector from the FlexMaster Web interface, refer to the FlexMaster documentation.

FIGURE 2-14 The FlexMaster Management options


System Time
Click Refresh to update the time displayed on this page. Click Synch Time with Your PC to manually synchronize the internal ZoneDirector clock with your administrative PC clock.
Your current system time is Friday, August 08, 2008 2:20:42 PM
Refresh
Use NTP to synchronize the ZoneDirector clock automatically
NTP Server* ntp.ruckuswireless.com
Sync Time with Your PC
Apply
Country Code
Different countries have different regulations on the usage of radio channels. To ensure that ZoneDirector is using an authorized radio channel, select the correct country code for your location.
Country Code: United States
Apply
Log Settings
Event Log Level
Show More
Warning and Critical Events
Critical Events Only
Remote Syslog
Enable reporting to remote syslog server at
(IP Address)
Apply
FlexMaster Management
Enter the FlexMaster server URL and set the time interval at which ZoneDirector will send status updates to FlexMaster.
Enable management by FlexMaster
URL
https://
/intune/server
Interval
15
(minutes)
Apply

CHAPTER 3

Managing a Wireless Local Area Network

Chapter Contents

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- *"Customizing WLAN Security"* 40
- *"Setting Dynamic Pre-Shared Key Expiration"* 44
- *"Configuring Access Control Lists"* 44
- *"Creating a New WLAN"* 46
- *"Creating a New WLAN for Workgroup Use"* 51
- *"Adding New Access Points to the WLAN"* 52
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Overview of Wireless Networks

When your ZoneDirector setup is complete, you have a fully functional wireless network, based on two secure WLANs ("internal" and "guest") with access for authorized users and guests. The internal WLAN provides "zero IT" connectivity for "standard" client devices, those computers running Windows XP/SP2 and utilizing WPA-ready NICs.

There are two scenarios in which you create additional WLANs, in addition to the internal WLAN: (1) To limit certain WLANs to groups of qualified users, to enhance security and efficiency. For example, an "Engineering" WLAN with a closed roster of users.) Or, (2) to configure a specific WLAN with different security settings. For example, you may need a WLAN that utilizes WEP encryption for wireless handheld devices that only support WEP-key encryption.

In the first scenario, specific WLANs (esp. regarding authentication and encryption algorithm) can be set up that support specific groups of users. This requires a two-step process: (1) create the custom WLAN and link it to qualified user accounts by "roles", and (2) assist all qualified users to prepare their client devices for custom WLAN connection.

As a result, you will have the default internal WLAN, plus the needed WLANs that fulfill different wireless security requirements.

Customizing WLAN Security

The default security environment for your internal WLAN incorporates a WPA-based authentication passphrase and the TKIP encryption algorithm, and utilizes a dynamic pre-shared key. To review the default WLAN configurations and the available options, review the following procedures.

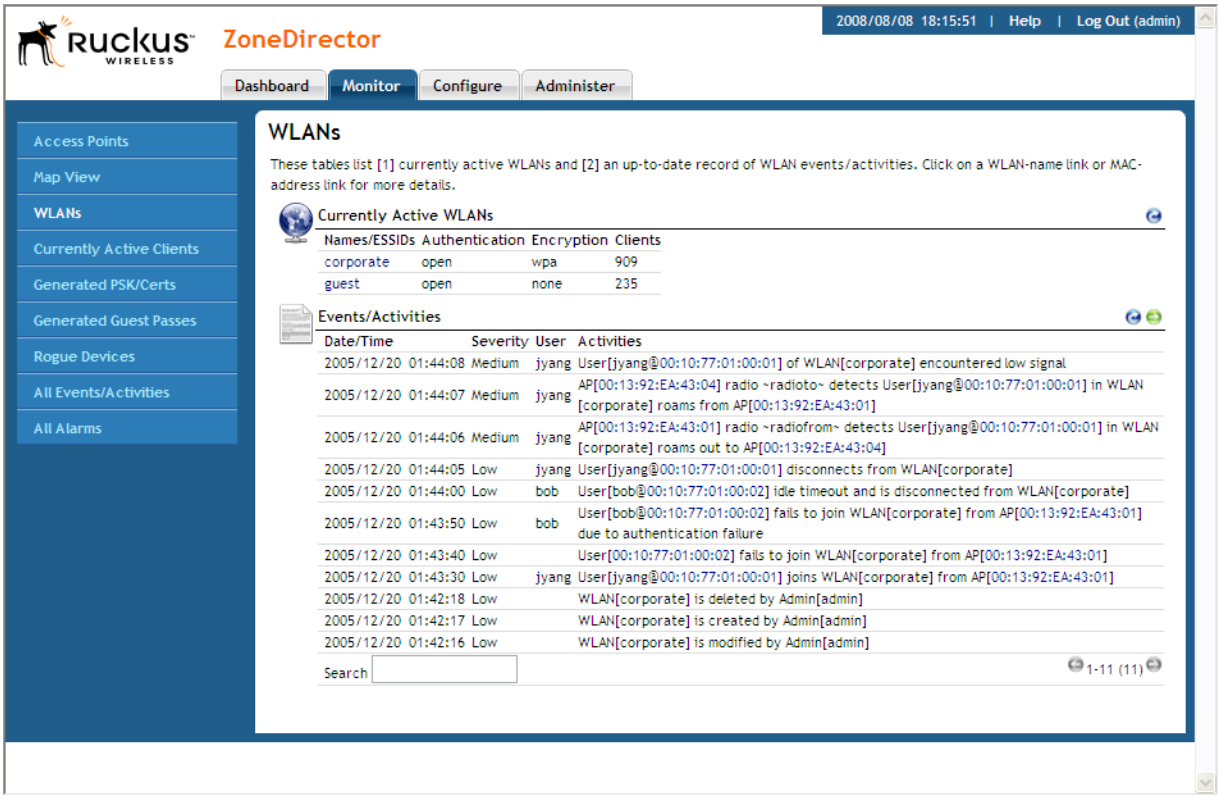
Reviewing the Initial Security Configuration

1 Go to **Monitor** > **WLANs**.

2 When the *WLANs* workspace appears, a *WLANs* table lists the two default WLANs created in the setup process: *corporate* and *guest*. The internal WLAN, *corporate*, is the one used by your authorized users, and you can review the details of its configuration by clicking the WLAN name. See "FIGURE 3-1" on page 41.

3 You have three options with the internal WLAN: [1] continue using the current configuration, [2] fine-tune the existing WPA-based mode, or [3] replace this mode entirely with either a WEP-based mode or an 802.1x mode. The two WLAN-editing processes are described separately, in the following sections.

FIGURE 3-1: The Monitor > WLANs page


Ruckus WIRELESS
ZoneDirector
2008/08/08 18:15:51 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
Access Points
Map View
WLANs
Currently Active Clients
Generated PSK/Certs
Generated Guest Passes
Rogue Devices
All Events/Activities
All Alarms
WLANs
These tables list [1] currently active WLANs and [2] an up-to-date record of WLAN events/activities. Click on a WLAN-name link or MAC-address link for more details.
Currently Active WLANs
Names/ESSIDs Authentication Encryption Clients
corporate open wpa 909
guest open none 235
Events/Activities
Date/Time Severity User Activities
2005/12/20 01:44:08 Medium jyang User[jyang@00:10:77:01:00:01] of WLAN[corporate] encountered low signal
2005/12/20 01:44:07 Medium jyang AP[00:13:92:EA:43:04] radio ~radioto~ detects User[jyang@00:10:77:01:00:01] in WLAN [corporate] roams from AP[00:13:92:EA:43:01]
2005/12/20 01:44:06 Medium jyang AP[00:13:92:EA:43:01] radio ~radiofrom~ detects User[jyang@00:10:77:01:00:01] in WLAN [corporate] roams out to AP[00:13:92:EA:43:04]
2005/12/20 01:44:05 Low jyang User[jyang@00:10:77:01:00:01] disconnects from WLAN[corporate]
2005/12/20 01:44:00 Low bob User[bob@00:10:77:01:00:02] idle timeout and is disconnected from WLAN[corporate]
2005/12/20 01:43:50 Low bob User[bob@00:10:77:01:00:02] fails to join WLAN[corporate] from AP[00:13:92:EA:43:01] due to authentication failure
2005/12/20 01:43:40 Low User[00:10:77:01:00:02] fails to join WLAN[corporate] from AP[00:13:92:EA:43:01]
2005/12/20 01:43:30 Low jyang User[jyang@00:10:77:01:00:01] joins WLAN[corporate] from AP[00:13:92:EA:43:01]
2005/12/20 01:42:18 Low WLAN[corporate] is deleted by Admin[admin]
2005/12/20 01:42:17 Low WLAN[corporate] is created by Admin[admin]
2005/12/20 01:42:16 Low WLAN[corporate] is modified by Admin[admin]
Search
1-11 (11)

Fine-tuning the Current Security Mode

1 In the internal WLAN (*corporate*) row, click **Edit** (if you haven't done so).

2 You can choose from the following options, which will enhance the default “zero IT” protection without disrupting the user's connections.

WPA2	Switch to this encryption method if you prefer the IEEE 802.11i standard.
AES	Switch to this algorithm for stronger encryption.
Passphrase	Replace the current passphrase with a new one.

3 Click **OK** to apply any changes.

Switching to a Different Security Mode

You also have the option of replacing the default internal WLANs’ WPA mode with one of two other modes:

- The less-secure protection of a WEP key mode
- The more-secure protection of an 802.1x mode

Replacing your WPA configuration with 802.1x requires the users to make changes to their Ruckus wireless connection configuration—including the importation of certificates.

1 Go to **Configure** > **WLANs**.

2 When the *WLANs* workspace appears, you will want to review, and then change the security options for the internal network. To start, click **Edit** in the internal row.

3 When the *Editing (corporate)* features appear, look at the two main categories—*Authentication Options* and *Encryption Options*.

4 If you click an *Authentication Option Method* such as **Open**, **Shared**, or **802.1x**, different sets of encryption options are displayed:

- **Open** allows you to configure a WPA- or WEP-based encryption, or "none" if you're so inclined. After selecting a WPA or WEP, you can then enter a passphrase or key text of your choosing.
- **Shared** limits you to WEP-key encryption.
- **802.1x EAP** allows you to choose from all available encryptions, but you do not need to create a key or passphrase.

5 Depending on your Authentication Option Method selection, review and reconfigure the related *Encryption Options*.

6 Review the *Advanced Options* to change any settings as needed. (For example, if you switch to 802.1x, you'll need to choose an authentication server from the menu.)

7 When you are finished, click **OK** to apply your changes.

Using the Built-in EAP Server

(*Requires the selection of "Local Database" as the authentication server.*) If you are reconfiguring your internal WLAN to use 802.1x/EAP authentication, you normally have to generate and install certificates for your wireless users. With the built-in EAP server and Zero-IT Wireless Activation, certificates are automatically generated and installed on the end user's computer. Users simply follow the instructions provided during the Zero-IT Wireless Activation process to complete this task. Once it is done, users can connect to the internal WLAN using 802.1x/EAP authentication.

Authenticating with an External RADIUS Server

You could use an external RADIUS server for your wireless client 802.1x/EAP authentication. An EAP-aware RADIUS server is required for this application. Also, you might need to deploy your own certificates for wireless client devices and for the RADIUS server you are using. In this case, ZoneDirector works as a bridge between your wireless clients and the RADIUS server during the wireless authentication process. ZoneDirector allows wireless clients to access the networks only after successful authentication of the wireless clients by the RADIUS server.

If You Change the Internal WLAN to WEP or 802.1x

If you replace the default WPA configuration of the internal WLAN, your users must reconfigure the wireless LAN connection settings on their devices. This process is described in detail and can be performed when logging into the WLAN as a new user.

If Switching to WEP-based Security:

1 Each user should be able to repeat the Zero-IT Wireless Activation process and install the WEP key by executing the activation script.

2 Alternatively, they could manually enter the WEP key text into their wireless device connection settings.

If Switching to 802.1x-based Security:

1 (*Applies only to the use of the built-in EAP server.*) Each user should be able to repeat the Zero-IT Wireless Activation process and download the certificates and an activation script generated by ZoneDirector

2 Each user must first install certificates to his/her computer.

3 Each user must then execute the activation script, in order to configure the correct wireless setting on his/her computer.

4 To manually configure 802.1x/EAP settings for non-Windows XP/SP2 client usage, use the wireless settings generated by ZoneDirector.

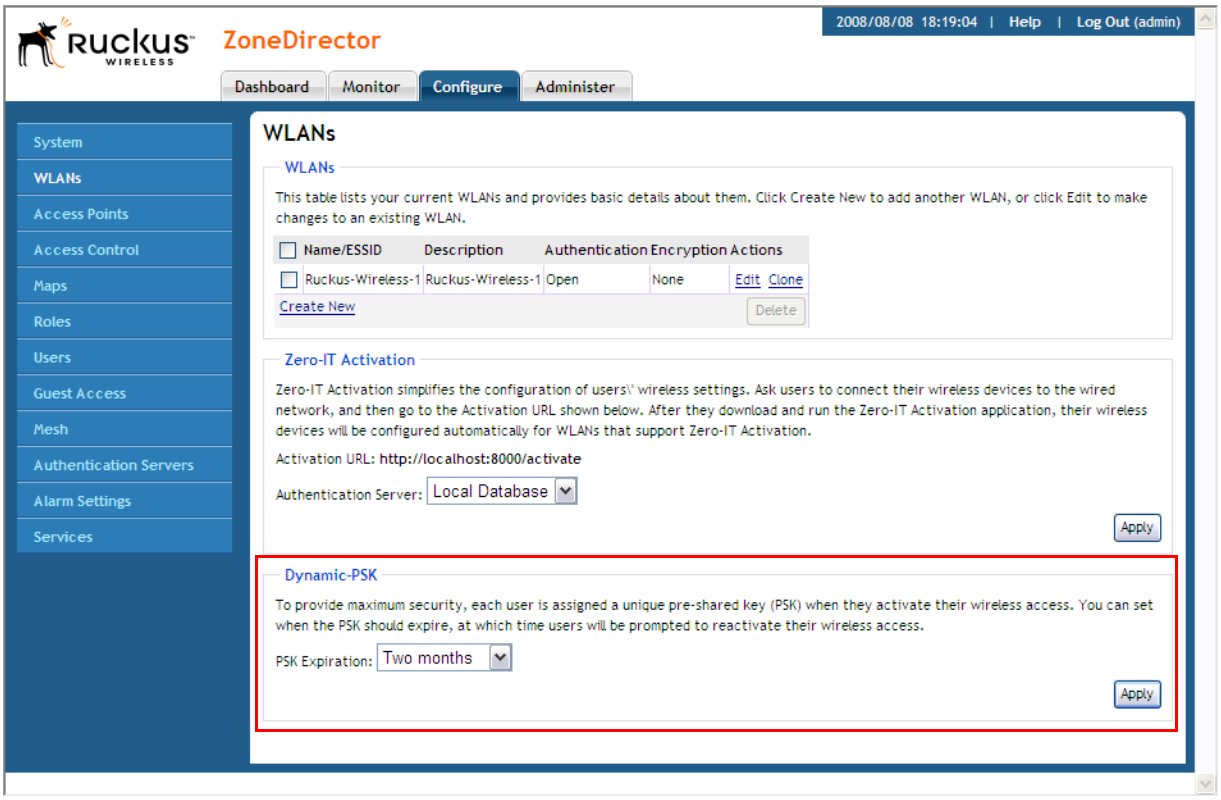
Setting Dynamic Pre-Shared Key Expiration

When network users first activate their access to the WLAN with Dynamic PSK enabled, a unique pre-shared key (PSK) is generated automatically for their authentication. (This was activated by default in the WLAN Setup Wizard.) By default, all dynamic pre-shared keys expire in two months. You can control when the PSK expires, at which time the users will be prompted to re-activate their wireless access.

1 Go to **Configure** > **WLANs**.

2 In the *Dynamic PSK* features, open the drop-down list and pick the lifespan interval for a new PSK.

FIGURE 3-2: The Dynamic PSK option


Ruckus WIRELESS
ZoneDirector
2008/08/08 18:19:04 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
System
WLANs
Access Points
Access Control
Maps
Roles
Users
Guest Access
Mesh
Authentication Servers
Alarm Settings
Services
WLANs
WLANs
This table lists your current WLANs and provides basic details about them. Click Create New to add another WLAN, or click Edit to make changes to an existing WLAN.
Name/ESSID
Description
Authentication
Encryption
Actions
Ruckus-Wireless-1
Ruckus-Wireless-1
Open
None
Edit
Clone
Create New
Delete
Zero-IT Activation
Zero-IT Activation simplifies the configuration of users\' wireless settings. Ask users to connect their wireless devices to the wired network, and then go to the Activation URL shown below. After they download and run the Zero-IT Activation application, their wireless devices will be configured automatically for WLANs that support Zero-IT Activation.
Activation URL: http://localhost:8000/activate
Authentication Server:
Local Database
Apply
Dynamic-PSK
To provide maximum security, each user is assigned a unique pre-shared key (PSK) when they activate their wireless access. You can set when the PSK should expire, at which time users will be prompted to reactivate their wireless access.
PSK Expiration:
Two months
Apply

3 Click **Apply** to save your settings. The new settings go into effect immediately.

Configuring Access Control Lists

You can build access control lists to establish which devices based on their MAC addresses are allowed to associate to ZoneDirector-managed APs. Using the Access Controls configuration options, you define Layer 2 ACLs, also known as MAC address ACLs, which can then be applied to one or more WLANs (upon WLAN creation or edit). ACLs are either allow-only or deny-only; that is, an ACL can be set up to allow only specified clients or to deny only specified clients.

MAC addresses that are in the ACL deny list are blocked at the AP, not at ZoneDirector.

TIP

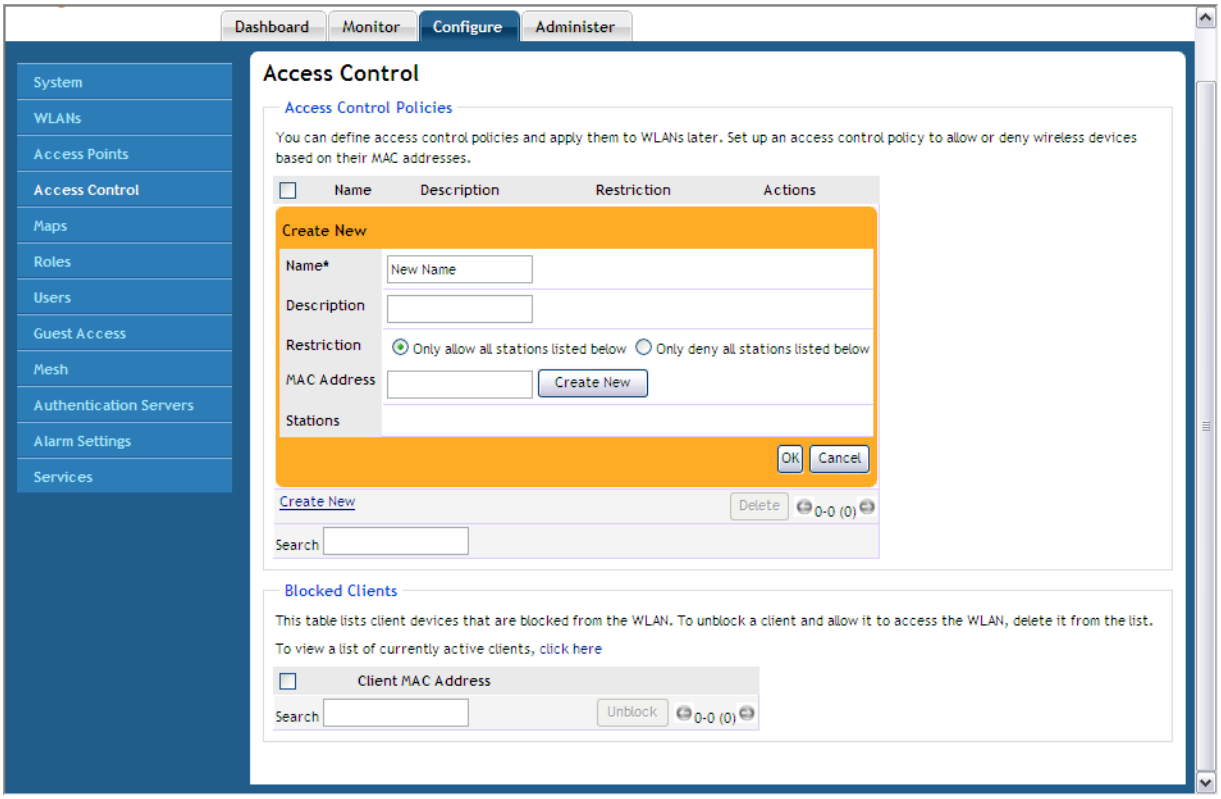
ZoneDirector also has a system-wide block list that is applied to all WLAN's in addition to the per-WLAN ACL. The entries of the system-wide block list are added when the admin chooses to block clients from the *Monitor/Current Active Clients* panel. The admin can remove entries from the system-wide block list via **Configure** > **Access Control** > **Block Clients** list. If a MAC address is listed in the system-wide block list, it will be blocked even if it is an allowed entry in other ACL list.

To configure an ACL:

1 Go to **Configure > Access Control**.

2 Under Access Control Policies, click **Create New**.

FIGURE 3-3: The Create New form for adding a MAC address to the access control list



3 Type a **Name** for the ACL.

4 Type a **Description** of the ACL.

5 Select the *Restriction mode* as either **allow** or **deny**.

6 Type a MAC address in the **MAC Address** text box, and then click **Create New** to save the address. The added address appears next to the *Stations* field.

7 Repeat Step 5 to add additional MAC addresses.

8 Click **OK** to save the ACL.

9 To apply the ACL, see the *Advanced Options* section in *"Creating a New WLAN"* on page 46.

Creating a New WLAN

There are cases in which you might want to create additional WLANs. For example, you might want to create a WLAN for WEP-only client devices. Or you might want to create a WLAN that utilizes 802.1x/EAP and certificates. The following shows how to create such WLANs that utilize different security settings.

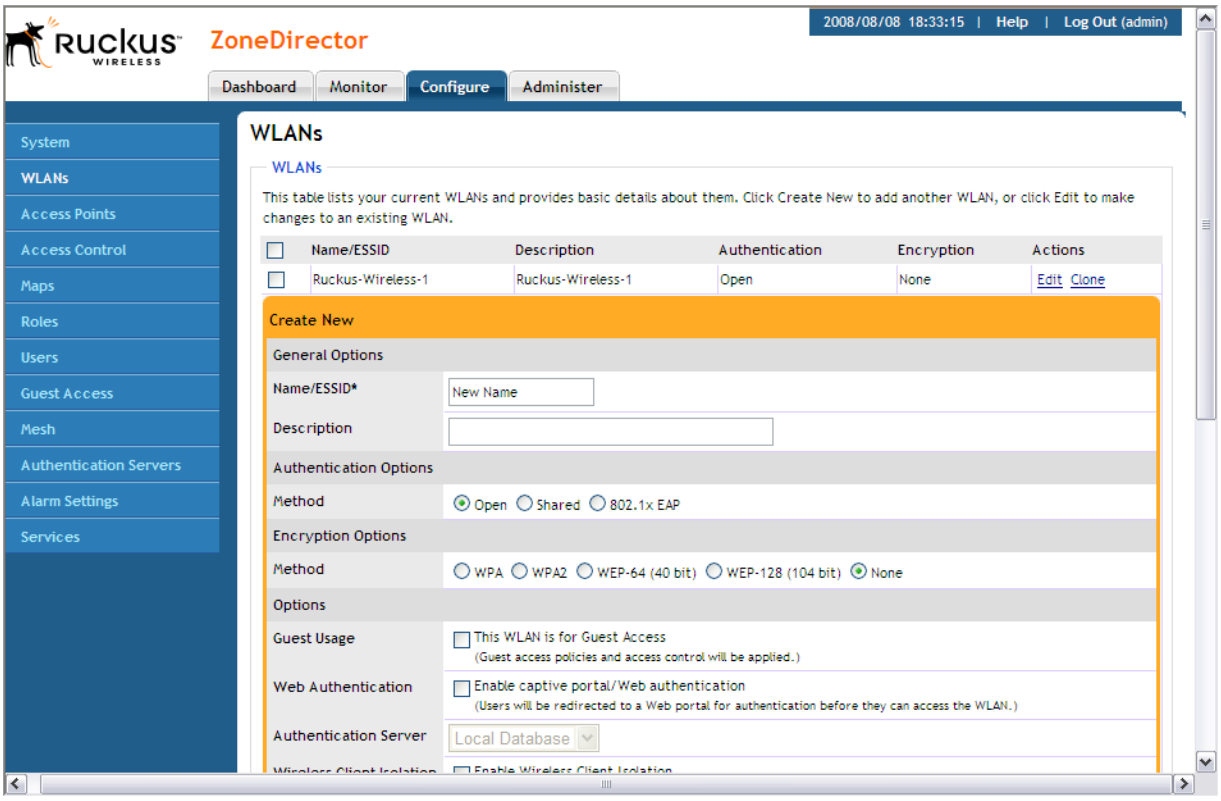
Creating a WLAN

To create a custom wireless LAN, follow these steps:

1 Go to **Configuration** > **WLAN**.

2 Click **Create New**.

FIGURE 3-4: The Create New form for adding a WLAN



The *Create New* workspace displays the following:

General Options

Name/ESSID	Type a short name (2–31 characters/numbers) for this WLAN.
Description	Enter a brief description of the qualifications/purpose for this WLAN, e.g., “Engineering” or “Voice”.

Authentication Method Options

Method	**Open. [Default]** No authentication mechanism is applied to connections. If WPA or WPA2 encryption is used, this implies WPA-PSK authentication. **Shared:** If you click Shared, only WEP encryption will be available, and the WEP Key option appears. Uses a shared WEP key for authentication. Requires creation of a WEP key, as detailed below. **802.1x EAP:** Uses 802.1x authentication mechanism. Requires use of certificates.

Encryption Options

Method	**None: [Default]** No encryption is applied; communications are in clear text. **WPA / WPA2:** (Not available to Shared authentication) Provides a higher level of encryption and is more secure. WPA and WPA2 require selection of an encryption algorithm (as detailed below). **WEP-64:** Provides a lower level of encryption, and is less secure, using 64-bit WEP encryption. **WEP-128:** Provides a higher level of encryption, using a 128-bit key for WEP encryption.

IMPORTANT	If you set the encryption method to WEP-64 (40 bit) or WEP-128 (104 bit) and you are using an 802.11n AP for the WLAN, the AP will operate in 802.11g mode.

Algorithm	(Only for WPA or WPA2 encryption methods) **TKIP: [Default]** This algorithm is effective. It is set as the default since some client devices do not support AES. **AES:** This algorithm provides a high degree of security.

IMPORTANT	• If you set the encryption algorithm to TKIP and you are using an 802.11n AP for the WLAN, the AP will operate in 802.11g mode. • If you set the encryption algorithm to TKIP, the AP will only be able to support up to 25 clients. When this limit is reached, additional clients will be unable to associate with the AP. On the other hand, if you disable encryption or select AES, the AP will be able to support up to 100 clients. If the wireless mesh network is also enabled, the AP will be able to support less than 100 clients.

WEP Key	WEP methods only. Click in the Hex field and type the required key text. If the key is for WEP 64 encryption, the key text must be up to 10 characters in length. If it is for WEP 128 encryption, enter a key up to 26 characters in length.
Passphrase	WPA/WP2 PSK methods only. Click in this field and type the text of the passphrase used for authentication.

Options

Guest Usage	If the WLAN being created is for Guest access, mark the This WLAN is for Guest Access check box. When selected, the Wireless Client Isolation option is automatically selected and cannot be unchecked. Guest WLANs are subject to guest access policies, such as redirection and subnet access restriction.
Web Authentication	[Available only with “Open” or “Shared” authentication.] Click the check box to require all WLAN users to complete a Web-based login to this network each time they attempt to connect.
Authentication Server	When “Web Authentication” is active, use this option to designate the server used to authenticate Web-based user login. When “802.1x” authentication is active, use this option to designate either “Local Database” or a configured RADIUS server as the authentication source.
Wireless Client Isolation	Wireless client isolation enables subnet restrictions for guests. When wireless client isolation is enabled for a WLAN, any stations associated to this WLAN will not be able to access the local LAN; rather, they can only access the Internet. Also, stations associated to this WLAN cannot communicate with each other, regardless of which APs they are associated to. The behavior of stations will be exactly as the stations that associate to a guest WLAN. The only difference between a WLAN with wireless client isolation enabled and a guest WLAN is that a guest WLAN requires users to enter a guest pass before they can access the network. Same guest policy will be applied to guest WLAN as well as WLANs with wireless client isolation enabled.
Zero IT Activation	Leave this option active (the default state), as it activates the Ruckus ZoneDirector's share in the automatic “new user” process, in which the new user's PC is efficiently (and speedily) configured for WLAN use.

Advanced Options

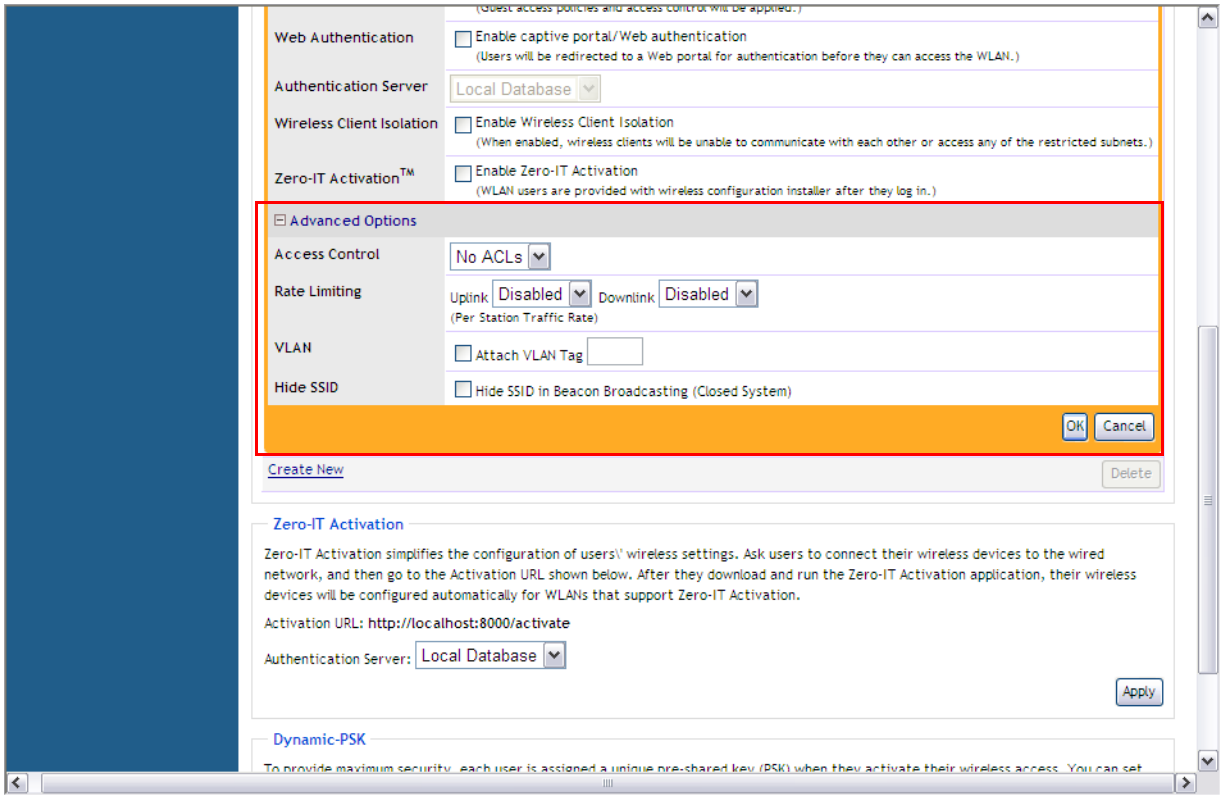
See “FIGURE 3-5” on page 50.

Access Controls	Toggle this drop-down list to select the ACL to apply to this WLAN. An ACL must be created before being available here. See *“Configuring Access Control Lists”* on page 44.

Rate Limiting	Rate limiting controls fair access to the network. When enabled, the network traffic throughput of each network device (i.e., client) is limited to the rate specified in the traffic policy, and that policy can be applied on either the uplink or downlink. Toggle the *Uplink* and/or *Downlink* drop-down lists to limit the rate at which WLAN clients upload/download data. The "Disabled" state means rate limiting is disabled; thus, traffic flows without prescribed limits.
VLAN	Select the **Attach VLAN Tag** check box to activate the VLAN function, and then type the relevant VLAN ID assigned to users/clients of your wireless network. (The ID should be a number between 1 and 4094).
Hide SSID	Activate this option if you don't want the ID of this WLAN advertised at any time. This will not affect the performance or force the WLAN user to perform any unnecessary tasks.
Tunnel Mode	Select this check box if you want to tunnel the WLAN traffic back to ZoneDirector. Tunnel mode enables wireless clients to roam across different APs on different subnets. If the WLAN has clients that require uninterrupted wireless connection (for example, VoIP devices and PDAs), Ruckus Wireless recommends enabling tunnel mode.

NOTE	The tunnel mode feature requires an additional license. You need to upload the required license file for the tunnel mode feature to work. For more information, see *"Upgrading the License"* on page 109.

FIGURE 3-5: Advanced Options on the WLAN page


Web Authentication
Enable captive portal/Web authentication
(Users will be redirected to a Web portal for authentication before they can access the WLAN.)
Authentication Server
Local Database
Wireless Client Isolation
Enable Wireless Client Isolation
(When enabled, wireless clients will be unable to communicate with each other or access any of the restricted subnets.)
Zero-IT Activation™
Enable Zero-IT Activation
(WLAN users are provided with wireless configuration installer after they log in.)
Advanced Options
Access Control
No ACLs
Rate Limiting
Uplink Disabled Downlink Disabled
(Per Station Traffic Rate)
VLAN
Attach VLAN Tag
Hide SSID
Hide SSID in Beacon Broadcasting (Closed System)
OK
Cancel
Create New
Delete
Zero-IT Activation
Zero-IT Activation simplifies the configuration of users\' wireless settings. Ask users to connect their wireless devices to the wired network, and then go to the Activation URL shown below. After they download and run the Zero-IT Activation application, their wireless devices will be configured automatically for WLANs that support Zero-IT Activation.
Activation URL: http://localhost:8000/activate
Authentication Server: Local Database
Apply
Dynamic-PSK

3 When you are finished, click **OK** to save the entries. This WLAN is ready for use.

4 You can now select from these WLANs when assigning roles to users, as detailed in *"Creating New User Roles"* on page 65.

Client Authentication Configuration

If your users are connecting with computers running Windows XP SP2/Vista, an automatic activation script is generated for them to install security settings of WLANs configured on the Ruckus ZoneDirector. If your users are connecting with computers running early versions of Windows, Mac OS X, Linux, or other operating systems, no activation script will be provided for them. Instead, a detailed page containing all necessary wireless settings is provided. Users must perform manual configuration on their computers based on these settings. The following grid records the details.

Open	WPA WPA-2 WEP-64 WEP-128	User must (1) manually enter the text of the same WEP key in their wireless network configuration, or (2) must manually enter the WPA passphrase.

Shared	WEP-64 WEP-128	User must manually enter the text of the same WEP key stored in the Ruckus ZoneDirector in their wireless network configuration.
802.1x	WEP-64 WEP-128 WPA/WPA2	User must obtain and install certificates generated on their computers. No key or passphrase is required.

Creating a New WLAN for Workgroup Use

If you want to create an additional WLAN based on your existing internal WLAN and limit its use to a select group of users (e.g, Marketing, Engineering), you can do so by following these steps:

1 Make a list of the group of users (who ideally are using client devices running Windows XP/SP2).

2 Go to **Monitor** > **WLANs**.

When the *WLANs* page appears, the default *corporate* and *guest* networks are listed in the table (once you have created a WLAN, it will appear in this table).

3 If you have no need for custom authentication or encryption methodologies in this new WLAN, locate the *corporate* WLAN record and click **Clone**.

A workspace appears, displaying the default settings of a new WLAN, using the same zero-IT configuration settings as "Corporate".

4 Type a descriptive name for this WLAN, and then click **OK**. This new WLAN is ready for use by selected users.

5 You can now assign access to this new WLAN to a limited set of "corporate" users, you can do so as detailed in *"Creating New User Roles"* on page 65

Adding New Access Points to the WLAN

If your staffing or wireless coverage needs increase, you can add APs to your network easily and efficiently. Depending on your network security preferences, the new APs can be automatically detected and activated, or new APs may require per-device manual approvals before becoming active.

The "Auto-JOIN" automatic AP activation process is active by default. If you prefer, you can disable Auto-JOIN. If this is your preference, ZoneDirector will detect new APs, alert you to their presence, and then wait for you to manually "approve" their activation—as detailed in this guide.

NOTE	For Auto-JOIN to work, the APs that you are adding must be on the same IP subnet or VLAN as ZoneDirector.

Connecting the APs to the WLAN

1 Place the new APs in the appropriate locations.

2 Write down the MAC address (on the bottom of each device) and note the specific location of each AP as you distribute them.

3 Connect the APs to the LAN with Ethernet cables.

4 Connect each AP to a power source.

NOTE	If the Ruckus Wireless APs that you are using are POE-capable and power sources are not convenient, they will draw power through the Ethernet cabling if connected to a POE-ready hub or switch.

Verifying/Approving New APs

1 Go to **Monitor** > **Access Points**. The Access Points page appears, showing the first 15 access points that have been approved or are awaiting approval. If ZoneDirector is managing more than 15 access points, the **Show More** button at the bottom of the page will be active. To display more access points in the list, click **Show More**. When all access points are displayed on the page, the **Show More** button disappears.

2 Review the *Currently Managed APs* table. See FIGURE 3-6.

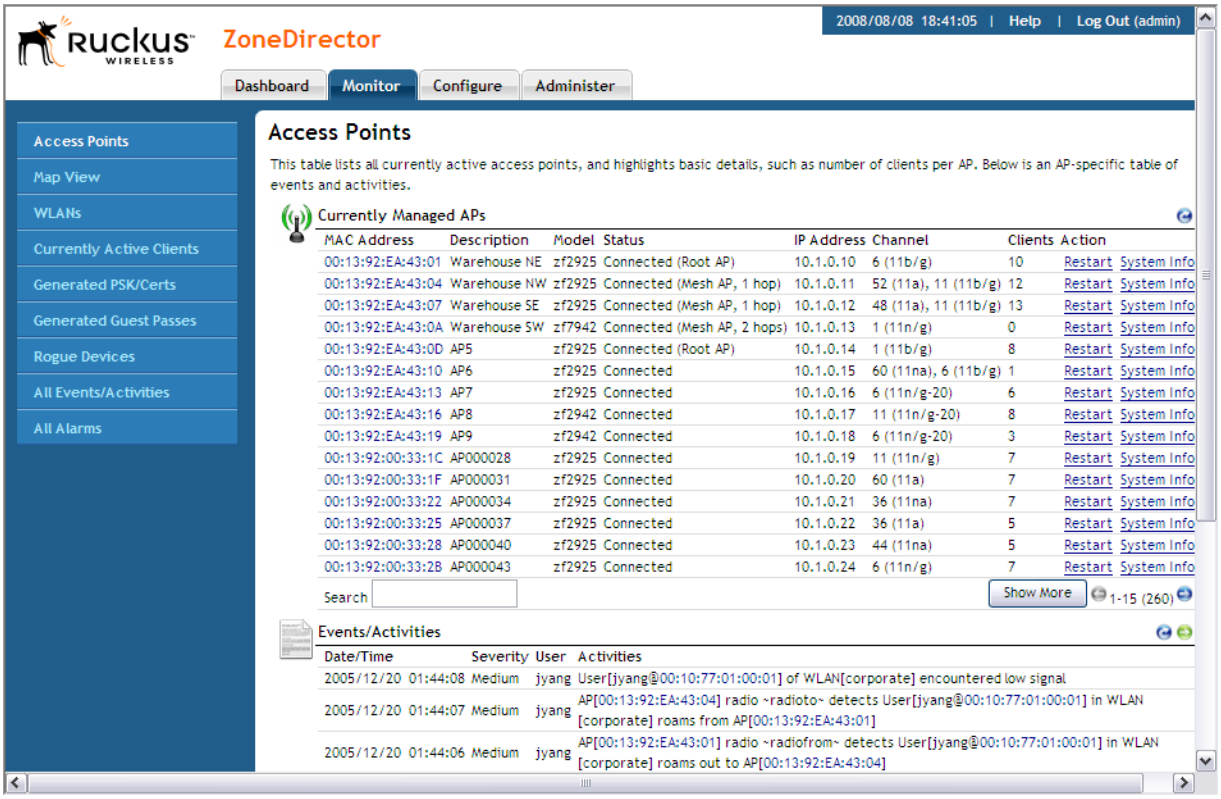
- If the **Configure > Access Points > Access Points Policies > Approval** check box is checked, all new APs should be listed in the table, and their *Status* should be "Connected".
- If the Auto-JOIN option is disabled, all new APs will be listed, but their status will be "Approval Pending."

3 Under the *Action* column, click **Allow**. After the status is changed from "Disconnected" to "Connected", the new AP is activated and ready for use.

4 Click **Apply** to save your settings.

TIP!	Use "Map View" (on the Monitoring tab) to place the marker icons of any newly approved APs. See *"Evaluating and Optimizing Network Coverage"* on page 100 for more information.

FIGURE 3-6: The Monitor > Access Points page


Ruckus WIRELESS
ZoneDirector
2008/08/08 18:41:05 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
Access Points
Map View
WLANs
Currently Active Clients
Generated PSK/Certs
Generated Guest Passes
Rogue Devices
All Events/Activities
All Alarms
Access Points
This table lists all currently active access points, and highlights basic details, such as number of clients per AP. Below is an AP-specific table of events and activities.
Currently Managed APs
MAC Address Description Model Status IP Address Channel Clients Action
00:13:92:EA:43:01 Warehouse NE zf2925 Connected (Root AP) 10.1.0.10 6 (11b/g) 10 Restart System Info
00:13:92:EA:43:04 Warehouse NW zf2925 Connected (Mesh AP, 1 hop) 10.1.0.11 52 (11a), 11 (11b/g) 12 Restart System Info
00:13:92:EA:43:07 Warehouse SE zf2925 Connected (Mesh AP, 1 hop) 10.1.0.12 48 (11a), 11 (11b/g) 13 Restart System Info
00:13:92:EA:43:0A Warehouse SW zf7942 Connected (Mesh AP, 2 hops) 10.1.0.13 1 (11n/g) 0 Restart System Info
00:13:92:EA:43:0D AP5 zf2925 Connected (Root AP) 10.1.0.14 1 (11b/g) 8 Restart System Info
00:13:92:EA:43:10 AP6 zf2925 Connected 10.1.0.15 60 (11na), 6 (11b/g) 1 Restart System Info
00:13:92:EA:43:13 AP7 zf2925 Connected 10.1.0.16 6 (11n/g-20) 6 Restart System Info
00:13:92:EA:43:16 AP8 zf2942 Connected 10.1.0.17 11 (11n/g-20) 8 Restart System Info
00:13:92:EA:43:19 AP9 zf2942 Connected 10.1.0.18 6 (11n/g-20) 3 Restart System Info
00:13:92:00:33:1C AP000028 zf2925 Connected 10.1.0.19 11 (11n/g) 7 Restart System Info
00:13:92:00:33:1F AP000031 zf2925 Connected 10.1.0.20 60 (11a) 7 Restart System Info
00:13:92:00:33:22 AP000034 zf2925 Connected 10.1.0.21 36 (11na) 7 Restart System Info
00:13:92:00:33:25 AP000037 zf2925 Connected 10.1.0.22 36 (11a) 5 Restart System Info
00:13:92:00:33:28 AP000040 zf2925 Connected 10.1.0.23 44 (11na) 5 Restart System Info
00:13:92:00:33:2B AP000043 zf2925 Connected 10.1.0.24 6 (11n/g) 7 Restart System Info
Search
Show More
1-15 (260)
Events/Activities
Date/Time Severity User Activities
2005/12/20 01:44:08 Medium jyang User[jyang@00:10:77:01:00:01] of WLAN[corporate] encountered low signal
2005/12/20 01:44:07 Medium jyang AP[00:13:92:EA:43:04] radio ~radioto~ detects User[jyang@00:10:77:01:00:01] in WLAN [corporate] roams from AP[00:13:92:EA:43:01]
2005/12/20 01:44:06 Medium jyang AP[00:13:92:EA:43:01] radio ~radiofrom~ detects User[jyang@00:10:77:01:00:01] in WLAN [corporate] roams out to AP[00:13:92:EA:43:04]

Reviewing Current Access Point Policies

The Access Point Policy options include how new APs are detected and approved for use in WLAN coverage. To review and revise the general AP policy, follow these steps:

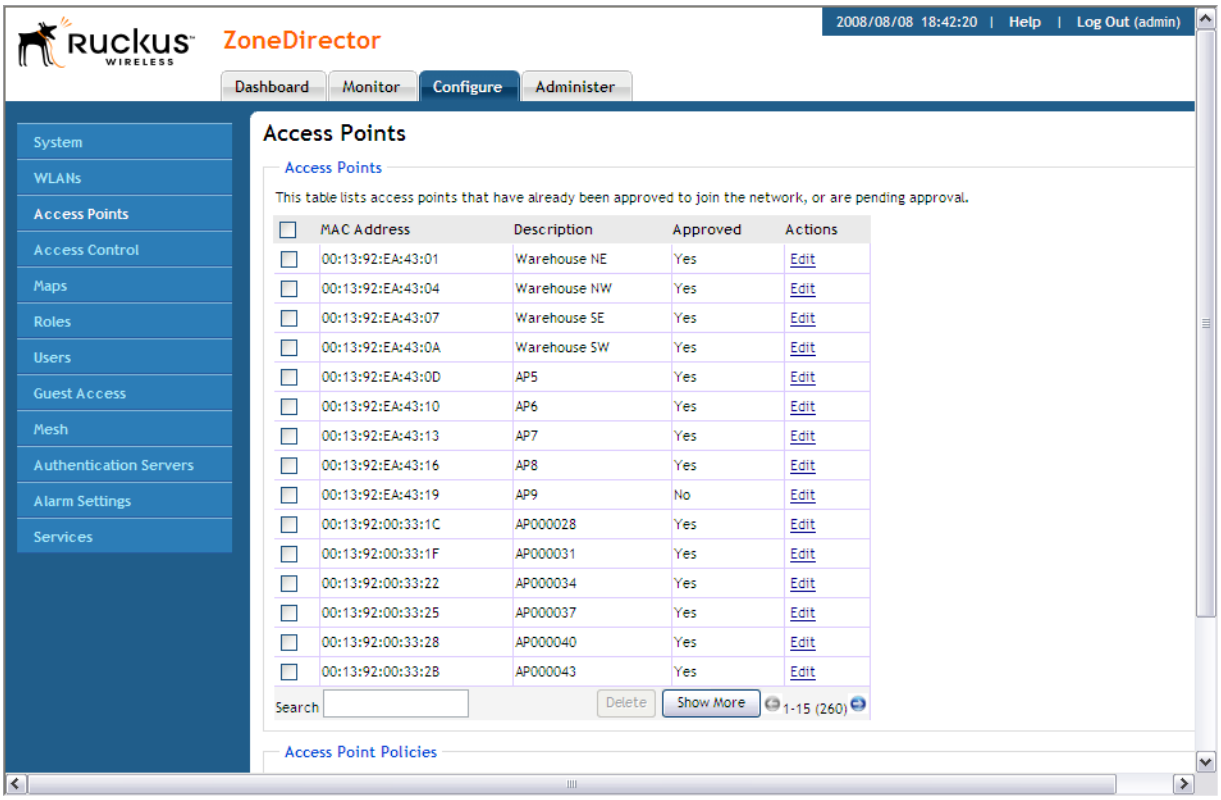
1 Go to **Configure** > **Access Points**.

2 Review the current settings in *Access Point Policies*. You can change the following:

Approval — If you prefer, you can disable this option if you want to manually review and approve the joining of new APs to the WLAN.

3 Click **Apply** to save your settings. This will affect only new/unapproved APs.

FIGURE 3-7: The Configure > Access Points page


Ruckus WIRELESS
ZoneDirector
2008/08/08 18:42:20 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
System
WLANs
Access Points
Access Control
Maps
Roles
Users
Guest Access
Mesh
Authentication Servers
Alarm Settings
Services
Access Points
Access Points
This table lists access points that have already been approved to join the network, or are pending approval.
MAC Address | Description | Approved | Actions
00:13:92:EA:43:01 | Warehouse NE | Yes | Edit
00:13:92:EA:43:04 | Warehouse NW | Yes | Edit
00:13:92:EA:43:07 | Warehouse SE | Yes | Edit
00:13:92:EA:43:0A | Warehouse SW | Yes | Edit
00:13:92:EA:43:0D | AP5 | Yes | Edit
00:13:92:EA:43:10 | AP6 | Yes | Edit
00:13:92:EA:43:13 | AP7 | Yes | Edit
00:13:92:EA:43:16 | AP8 | Yes | Edit
00:13:92:EA:43:19 | AP9 | No | Edit
00:13:92:00:33:1C | AP000028 | Yes | Edit
00:13:92:00:33:1F | AP000031 | Yes | Edit
00:13:92:00:33:22 | AP000034 | Yes | Edit
00:13:92:00:33:25 | AP000037 | Yes | Edit
00:13:92:00:33:28 | AP000040 | Yes | Edit
00:13:92:00:33:2B | AP000043 | Yes | Edit
Search
Delete
Show More
1-15 (260)
Access Point Policies

Editing Access Point Parameters

You can add a description, or change the channelization, channel, or transmit power settings of a managed access point by editing the APs parameters.

To edit the parameters of an access point:

1 Go to **Configure** > **Access Points**.

2 Find the AP to edit in the *Access Points* table, and then click **Edit** under the *Action* column.

3 Edit any of the following:

Description	Enter a description for the AP, such as the location.
Channelization	(For 802.11n only) The "channel width" determines the manner in which the spectrum is used during transmission.
Channel	This is the channel used by the APs network.
TX Power	Specifies the maximum transmit power level relative to the calibrated power.

NOTE

When mesh is enabled, the TX Power option becomes inactive and is automatically set to **Full**. This setting helps make the mesh network stable by ensuring that the mesh APs always transmit at full power.

4 If the AP is currently connected to ZoneDirector, the **Management IP** options appear. Use these options to configure the IP settings of the AP.

- If you want the AP to automatically obtain its IP address settings from a DHCP server on the network, click the **DHCP** option in **By-DHCP**. You do not need to configure the other settings (netmask, gateway, and DNS servers).
- If you want to assign a static IP address to the AP, click the **Manual** option in **By-DHCP**, and then set the values for the following options:
  - IP Address
  - Netmask
  - Gateway
  - Primary DNS Server
  - Secondary DNS Server

5 Under **Advanced Options** > **Uplink Selection**, select the **Manual** radio button. The other APs in the mesh appear below the selection.

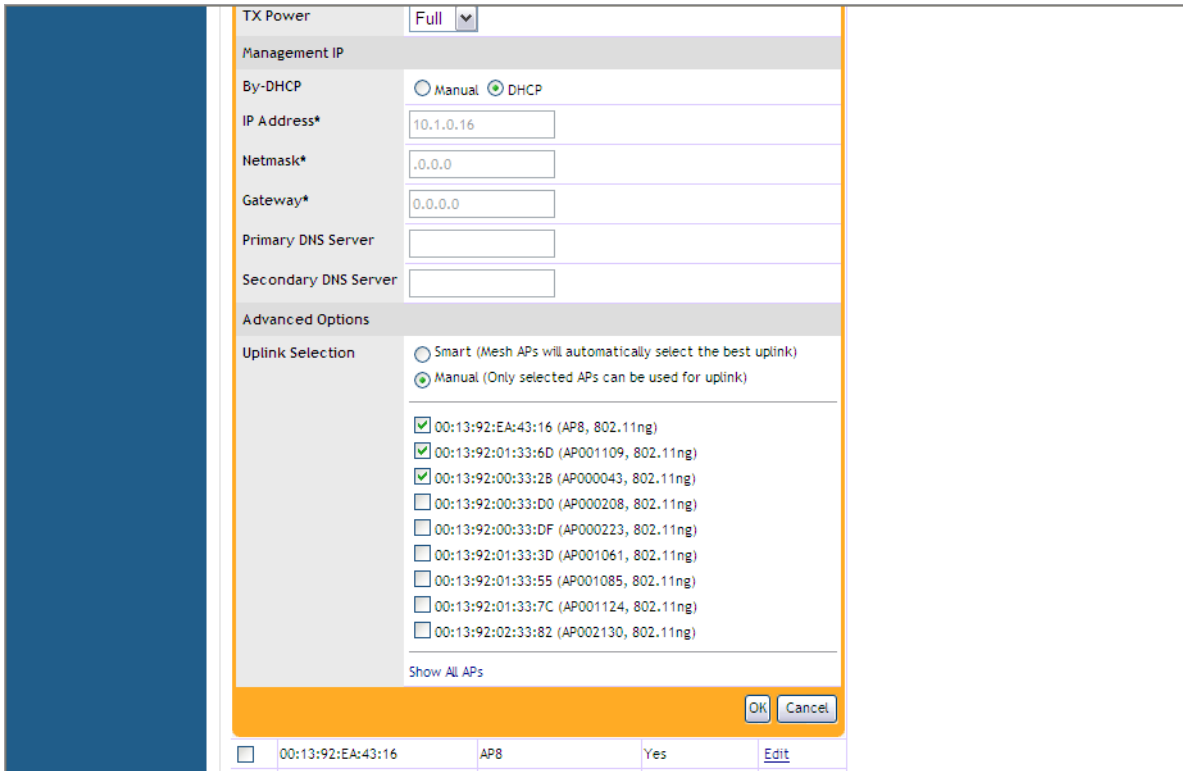
6 Select the check box for each AP that the current AP can use as uplink.

NOTE

If you set **Uplink Selection** for an AP to **Manual** and the uplink AP that you selected is off or unavailable, the AP status on the **Monitor** > **Access Points** page will appear as *Isolated Mesh AP*.

7 Click **OK** to save your settings.

FIGURE 3-8



Deploying ZoneDirector WLANs in a VLAN Environment

You can set up a ZoneDirector wireless LAN as an extension of a VLAN network environment, but certain qualifications must be met due to the fact that management traffic between ZoneDirector and the APs is not VLAN-tagged. The WLAN-in-VLAN qualifications include the following:

- Verifying that the VLAN switch supports native VLANs. A *native VLAN* is a VLAN that allows the user to designate untagged frames going in/out of a port to a specific VLAN.

  For example, if an 802.1Q port has VLANs 2, 3, and 4 assigned to it with VLAN 2 being the Native VLAN, frames on VLAN 2 that egress (exit) the port are not given an 802.1Q header (i.e., they are plain Ethernet frames). Frames which ingress (enter) this port and have no 802.1Q header are put into VLAN 2. Behavior of traffic relating to VLANs 3 and 4 is intuitive.

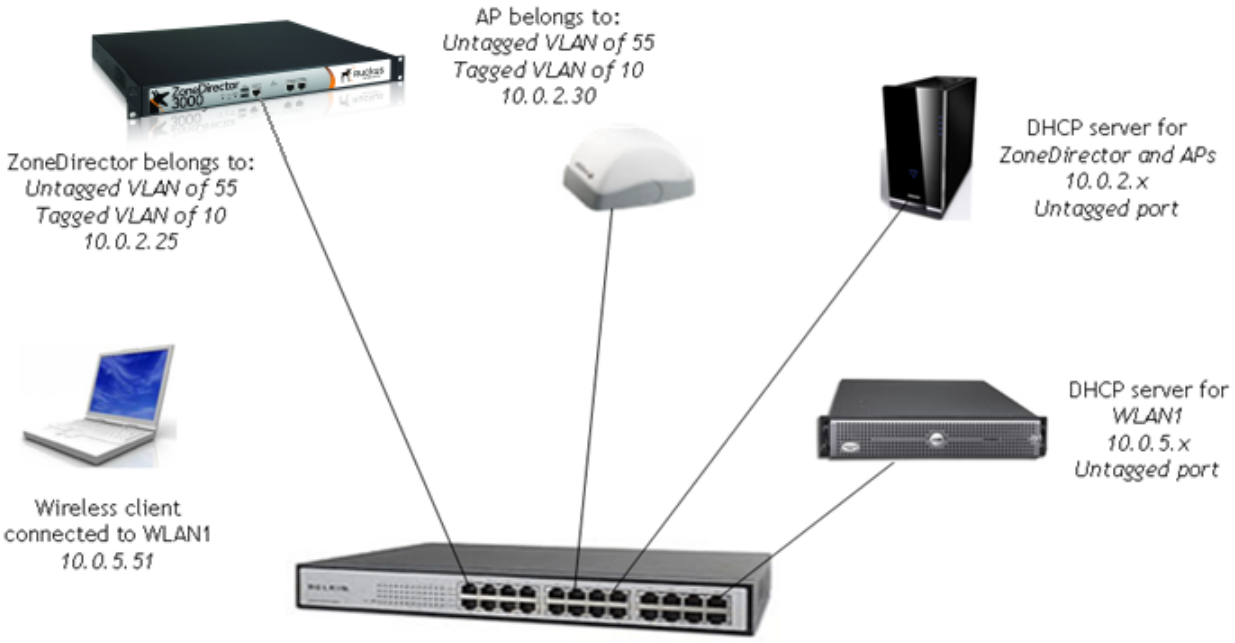
- Connecting ZoneDirector and any Access Points (APs) to VLAN trunk ports in the VLAN switch

- Verifying that those trunk ports are on the same native VLAN

NOTE	All DNS, DHCP, ARP, and HTTP traffic from an unauthenticated wireless client will be passed onto ZoneDirector from the AP via the management VLAN. If the client belongs to a particular VLAN, ZoneDirector will add the corresponding VLAN tag before passing traffic to the corresponding wired network. After client authentication is performed, client traffic will directly go to the wired network from the AP, which will add the corresponding VLAN tag. This explains why it is necessary to configure tagged VLANs for all VLAN switch ports connecting to ZoneDirector and APs.

Example configuration (“FIGURE 3-9” on page 57): VLAN ID 55 is used for management, and wlan1 is tagged with VLAN ID 10.

FIGURE 3-9



Blocking Client Devices

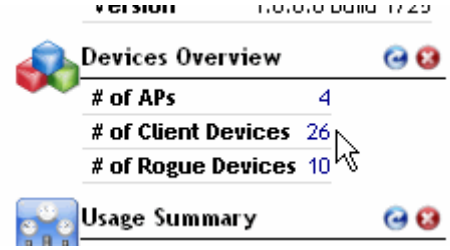
When users log into a ZoneDirector network, their client devices (for example, laptop computers and PCs) are recorded and tracked. If, for any reason, you need to block a client device from network use, you can do so from the Web interface. The following subtopics describe various tasks that you can perform to monitor, block and track client devices.

Monitoring Client Devices

1 Go to the **Dashboard**, if it's not already in view.

2 Under *Devices Overview*, look at **# of Client Devices**.

FIGURE 3-10



3 Click the current number, which is also a link. The **Currently Active Clients page** (on the **Monitor** tab) appears, showing the first 15 clients that are currently connected to ZoneDirector. If there are more than 15 currently active clients, the **Show More** button at the bottom of the page will be active. To display more clients in the list, click **Show More**. When all active clients are displayed on the page, the **Show More** button disappears.

4 When the *Currently Active Clients* page under the **Monitor** tab appears, review the *Clients* table.

To block any listed client devices, follow the next set of steps.

Temporarily Disconnecting Specific Client Devices

Follow these steps to temporarily disconnect a client device from your WLAN. (The user can simply reconnect manually, if they prefer.) This is helpful as a troubleshooting tip for problematic network connections.

1 Look at the *Status* column to identify any “Unauthorized” users.

2 Click the **Delete** button in the *Action* column in a specific user row.

The entry is deleted from the *Active/Current Client* list, and the listed device is disconnected from your Ruckus WLAN.

NOTE	The user can reconnect at any time, which, if this proves to be a problem, may prompt you to consider the following client option.

Permanently Blocking Specific Client Devices

Follow these steps to permanently block a client device from WLAN connections.

1 Look at the *Status* column to identify any unauthorized users.

2 Click the **Block** button in the *Action* column in a specific user row.

The status is changed to "Blocked". This will prevent the listed device (and its user) from using your Ruckus WLAN.

Reviewing a List of Previously Blocked Clients

1 Go to **Configure** > **Access Controls**.

2 Review the *Blocked Clients* table.

3 You can unblock any listed MAC address by clicking the **Unblock** button for that address.

Optimizing Access Point Performance

ZoneDirector through the Web interface enables you to remotely monitor and adjust key hardware settings on each of your network APs. After assessing AP performance in the context of network performance, you can reset channels and adjust transmission power, as needed.

Assessing Current Performance by Using the Map View

REQUIREMENT: The importing of a floorplan and placement of APs are detailed in *"Importing a Map View Floorplan Image"* on page 90 and *"Placing the Access Point Markers"* on page 91.

1 Go to **Monitor** > **Map View**.

If *Map View* displays a floorplan with active device symbols, you can assess the performance of individual APs, in terms of coverage. (For detailed information on the Map View, see *"Using the Map View Tools"* on page 92.)

2 In the *Coverage* options, click **Yes**.

3 When the "heat map" appears, look for the **Signal%** scale in the upper right corner of the map.

4 Note the overall color range, especially colors that indicate low coverage.

5 Look at the floorplan and evaluate the current coverage. You can make adjustments as detailed in the following procedure.

Improving AP RF Coverage

1 Click and drag individual AP markers to new positions on the Map View floorplan until your RF coverage coloration is optimized. There may be a need for additional APs to fill in large coverage gaps.

2 When your adjustments are complete, note down the new locations of relocated AP markers.

3 After physically relocating the actual APs in conformance to the Map View placements, disconnect and reconnect the APs to a power source.

4 To refresh the ZoneDirector Map View, run a full-system RF Scan, as detailed in *"Starting a Radio Frequency Scan"* on page 120.

5 When the RF scan is complete and ZoneDirector has recalibrated the Map View, you can assess your changes, and make further adjustments as needed.

Assessing Current Performance by Using the Access Point Table

1 Go to **Monitor** > **Access Points**.

2 When the *Access Points* page appears, review the *Currently Active APs* for specific AP settings, especially the *Channel* and *Clients* columns.

3 If you want to make changes to individual AP settings, proceed to the next task.

Adjusting AP Settings

1 Go to **Configure** > **Access Points**.

2 Review the *Access Points* table and identify an AP that you want to adjust.

3 Click the **Edit** button in that AP row.

4 Review and adjust any of the following Editing (AP) options:

NOTE Some options are read-only depending on the approval status.

MAC Address	This information is taken from the AP. It cannot be modified in ZoneDirector.
Description	Enter a short description of this device and its current location.
Radio B/G Channel	Choose a specific channel for use by 802.11b/g devices from this drop-down list.
TX Power	Choose the amount of power allocated to this channel. The default setting is "Auto" and your options range from "Full" to "1/8".

NOTE When mesh is enabled, the TX Power option becomes inactive and is automatically set to **Full**. This setting helps make the mesh network stable by ensuring that the mesh APs always transmit at full power.

5 Click **OK**. The adjusted AP will be automatically restarted, and when it is active, will be ready for network connections.

CHAPTER 4

Managing User and Guest Access

Chapter Contents

- *"Using an External Server for User Authentication"* 62
- *"Adding New User Accounts to ZoneDirector"* 63
- *"Managing Current User Accounts"* 64
- *"Creating New User Roles"* 65
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- *"Activating Web Authentication of Users"* 72
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Using an External Server for User Authentication

Once your wireless network is set up, you can instruct ZoneDirector to authenticate wireless users using your existing Active Directory server, an existing RADIUS server, or to create new user accounts on the internal user database.

To use a RADIUS or Active Directory server as an authentication server:

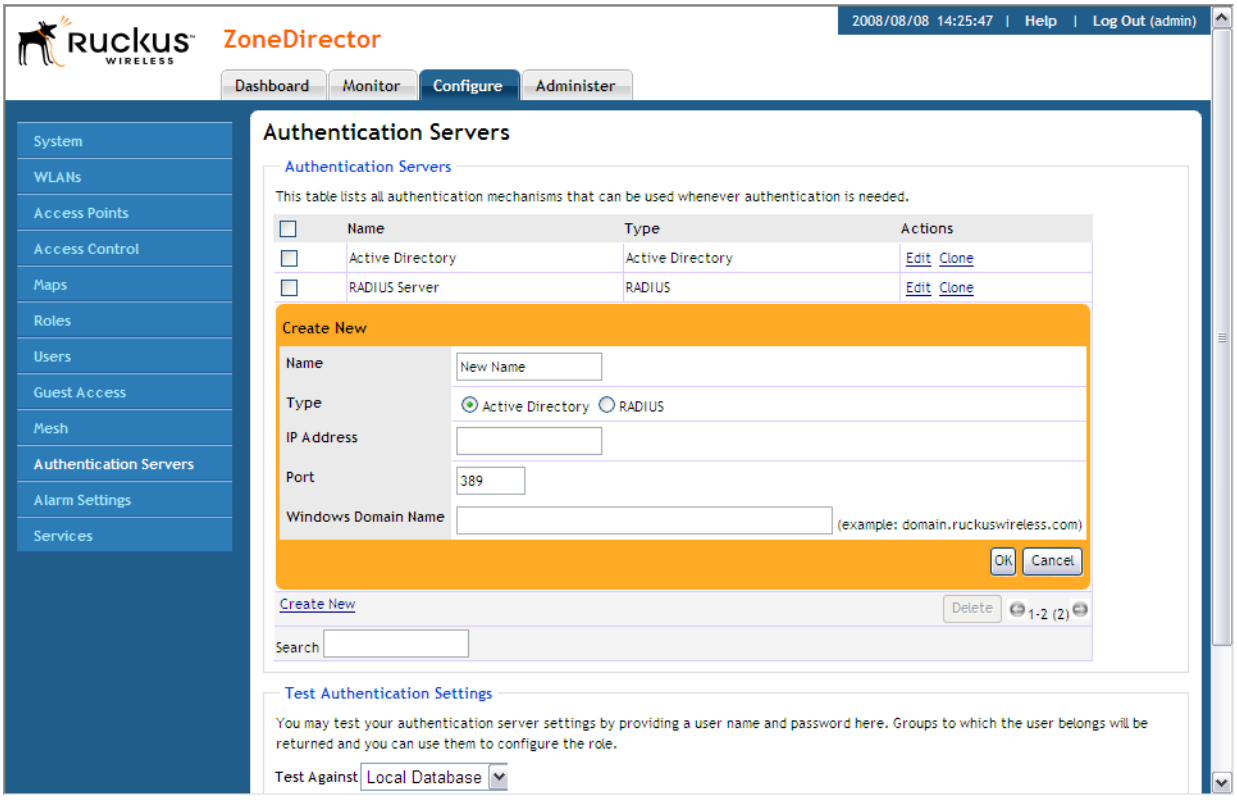
1 Go to **Configure** > **Authentication Servers**.

2 When the *Authentication Servers* page appears, click the **Create New** link in the *Authentication Servers* table.

3 When the *Create New* form appears, make the following entries:

- Click in the *Name* field and type a descriptive name (for example, "Active Directory").
- Verify that "Active Directory" or "RADIUS" is selected as the *Type*.
- Enter the *IP Address* of the Active Directory server.
- Enter a *Port* number, if different from "389" for Active Directory or "1812" for RADIUS.
- (For Active Directory only) Enter the *Domain name* of the Active Directory server, for example, "`domain.ruckuswireless.com`".
- (For RADIUS only) Enter the *Shared Secret*, and then re-enter that secret in *Confirm Secret*.

FIGURE 4-1: The Create New form for adding authentication servers



4 Click **OK** to save this server entry.

TIP Test your connection to the Active Directory server by entering an existing user ID and password in the *Test Authentication Settings* panel.

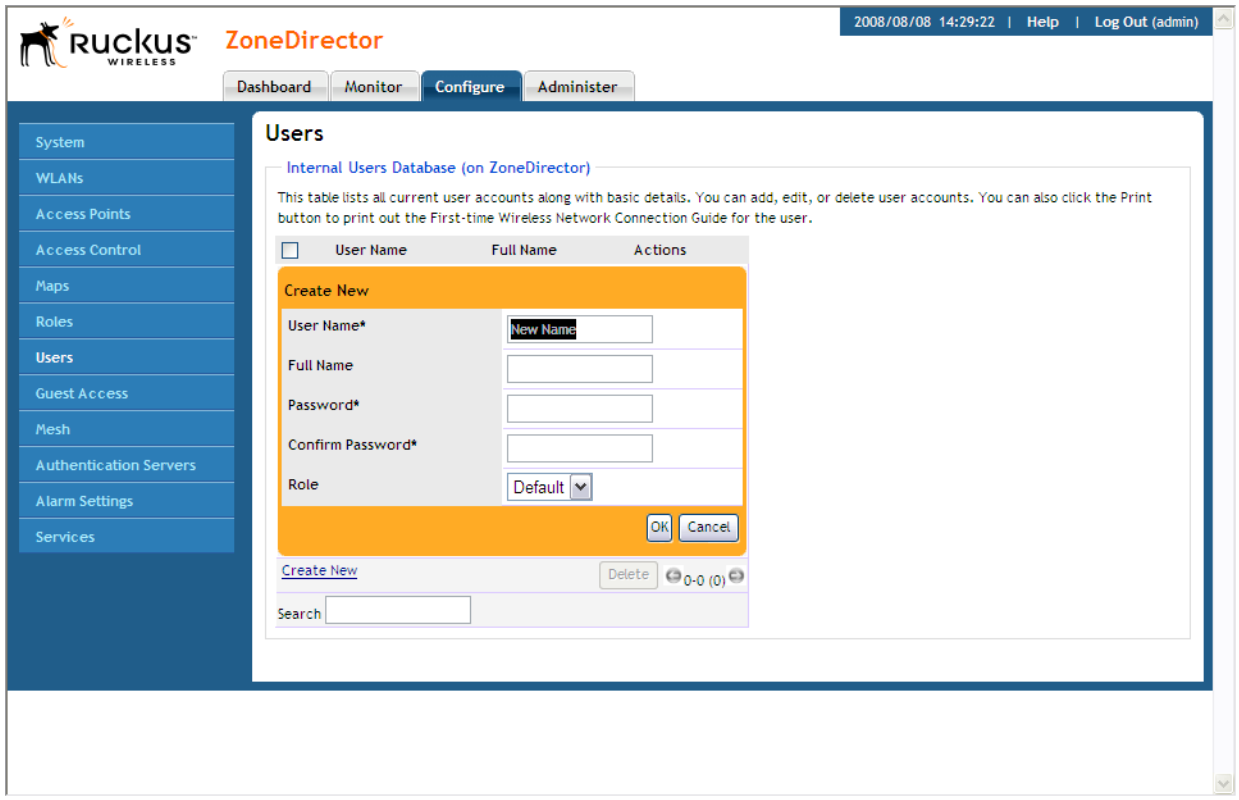
Adding New User Accounts to ZoneDirector

Once your wireless network is set up, you can instruct the Ruckus ZoneDirector to authenticate wireless users using an existing Active Directory server or RADIUS server, or to authenticate users by referring to accounts that are stored in ZoneDirector's internal user database. To use the internal user database as the default authentication source and to create new user accounts in the database, follow the steps:

1 Go to **Configure** > **Users**.

2 In the *Internal User Database* table, click **Create New**.

FIGURE 4-2: The Create New form for adding users to the internal database



3 When the *Create New* form appears, fill in the text fields with the appropriate entries:

User Name — Enter a name for this user, up to 32 characters in length, using letters, numbers and the period (.) character. User names are case-sensitive.

Full Name	Enter the assigned user's first and last name.
Password	Enter a unique password for this user, using a combination of letters and numbers, between 4 and 32 characters in length. Do not incorporate any letter spaces. Passwords are case-sensitive.
Confirm Password	Re-enter the same password for this user.

4 If you have created roles that enable non-standard client logins or that gather staff members into workgroups, open the **Role** menu, and then choose the appropriate role for this user. For more information on roles and their application, see *"Creating New User Roles"* on page 65.

5 Click **OK** to save your settings. Be sure to communicate the user name and password to the appropriate end user.

Managing Current User Accounts

ZoneDirector allows you to review your current user roster on the internal user database and to make changes to existing user accounts as needed.

Changing an Existing User Account

1 Go to **Configure** > **Users**.

2 When the *Users* features appear, locate the specific user account in the *Internal User Database* panel, and then click **Edit**.

3 When the *Editing [user name]* form appears, make the needed changes.

4 If a role must be replaced, open that menu and choose a new role for this user. [For more information, see *"Creating New User Roles"* on page 65.]

5 Click **OK** to save your settings. Be sure to communicate the relevant changes to the appropriate end user.

Deleting a User Record

1 Go to **Configure** > **Users**.

2 When the *Users Authentication* features appear, review the "Internal Users Database".

3 To delete one or more records, click the check boxes by those account records.

4 Click the now-active **Delete** button.

5 When the *Deletion Confirmation* dialog box appears, click **OK** to save your settings. The records are removed from the internal users database.

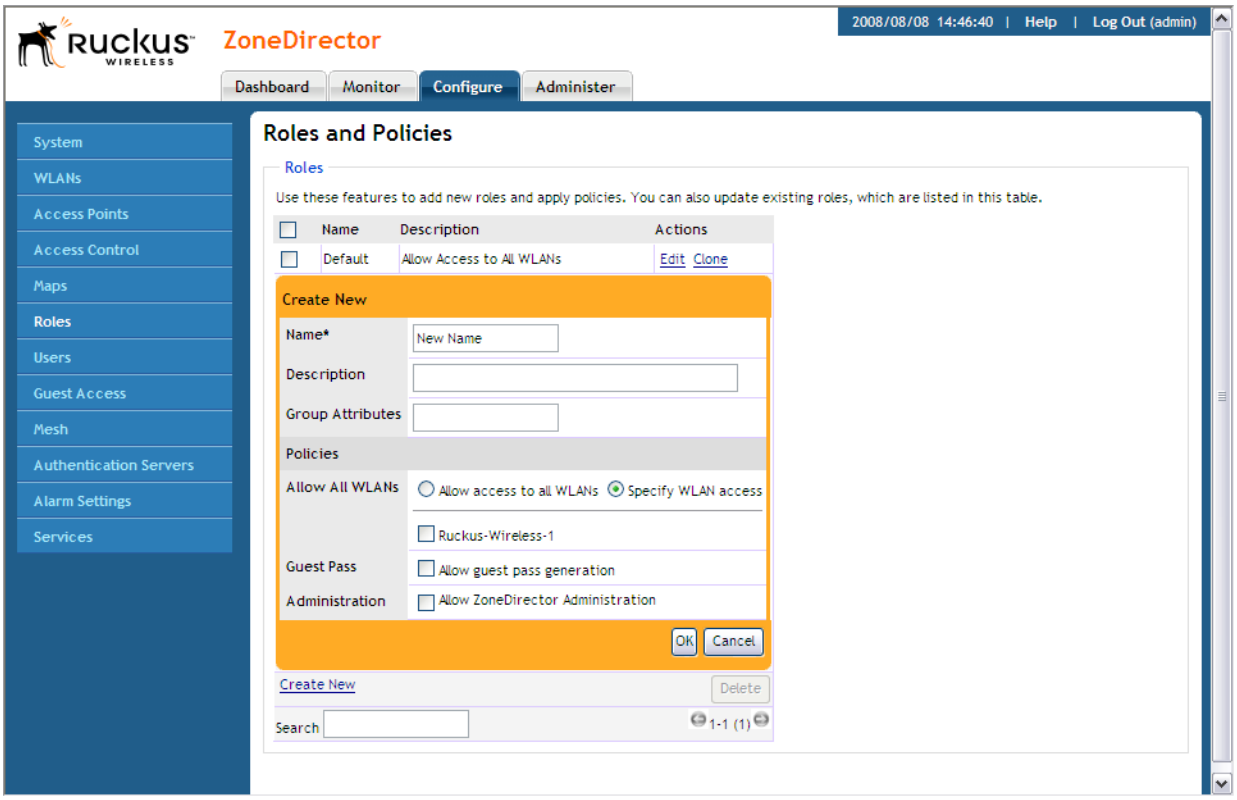
Creating New User Roles

ZoneDirector provides a "Default" role that is automatically applied to all new user accounts. This role links all users to the internal WLAN and permits any user to obtain guest passes for on-site visitor use. As an alternative, you can create additional roles that you can assign to selected wireless network users, to limit their access to certain WLANs, to allow them to log in with non-standard client devices, or to grant permission to generate guest passes. (You can then edit the "default" role to disable the guest-pass generation option.)

1 Go to **Configuration** > **Roles**. The *Roles and Policies* page appears, displaying a "Default" role in the *Roles* table.

2 Click **Create New** (below the *Roles* table).

FIGURE 4-3: The Create New form for adding a role



3 Enter a *Name* and a short *Description* for this role.

4 Choose the options for this role from the following:

Group Attributes — This field is only available if you choose Active Directory as your authentication server. Enter the Active Directory User Group names here. Active Directory users with the same group attributes are automatically mapped to this user role.

Allow All WLANs — You have two options: (1) **Allow Access to all WLANs**, or (2) **Specify WLAN Access**. If you select the second option, you must specify the WLANs by clicking the check box next to each one.

This option requires that you create WLANs prior to setting this policy. See “Creating a New WLAN for Workgroup Use” on page 28.

Guest Pass — If you want users with this role to have permission to generate guest passes, enable this option.

5 When you are finished, click **OK** to save your settings. This role is ready for assignment to authorized users.

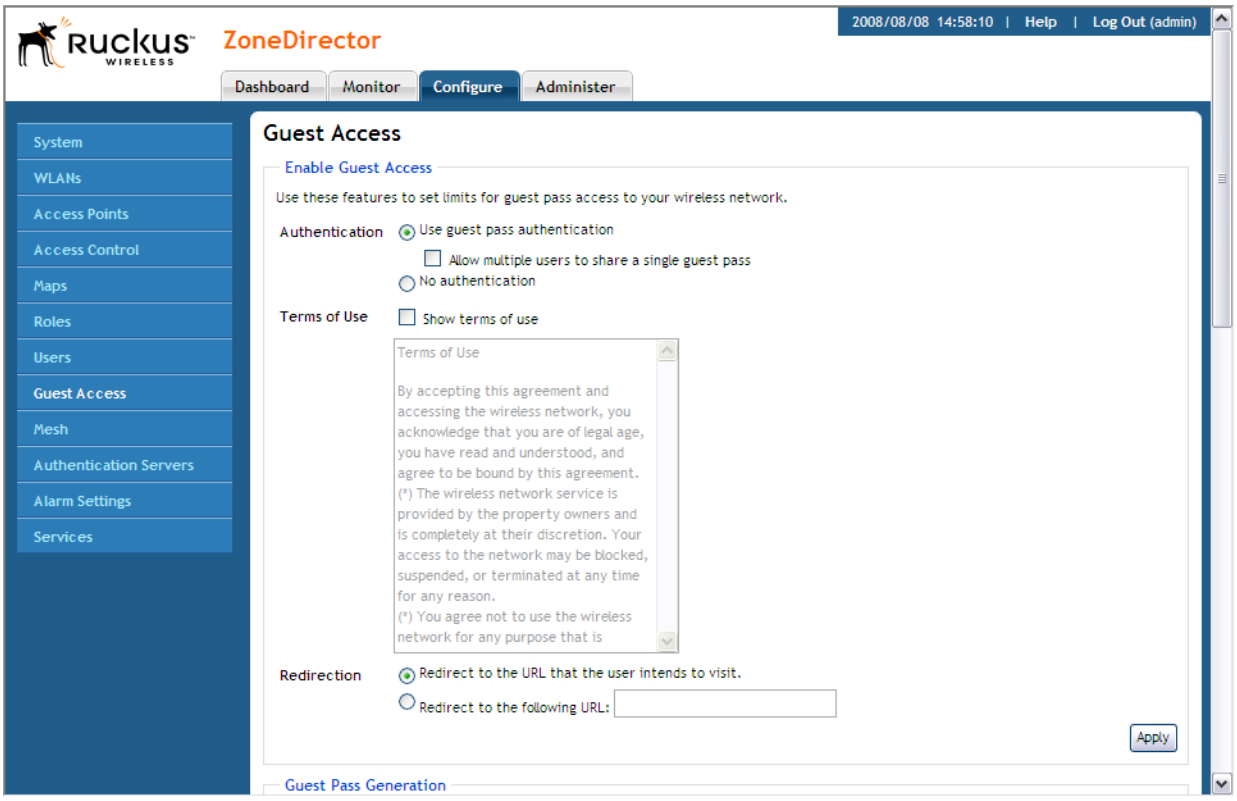
6 If you want to create additional roles with different policies, repeat this procedure.

Configuring System-Wide Guest Access Policy

The *Enable Guest Access (System-side)* options enable the administrator to define the system-wide guest access policy. You can require guests to validate their guest pass, accept terms of use, and be redirected to a URL you specify.

1 Go to **Configure > Guest Access**. The *Guest Access* page appears.

FIGURE 4-4: The Guest Access page


Ruckus WIRELESS
ZoneDirector
2008/08/08 14:58:10 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
System
WLANs
Access Points
Access Control
Maps
Roles
Users
Guest Access
Mesh
Authentication Servers
Alarm Settings
Services
Guest Access
Enable Guest Access
Use these features to set limits for guest pass access to your wireless network.
Authentication
Use guest pass authentication
Allow multiple users to share a single guest pass
No authentication
Terms of Use
Show terms of use
Terms of Use
By accepting this agreement and accessing the wireless network, you acknowledge that you are of legal age, you have read and understood, and agree to be bound by this agreement.
(*) The wireless network service is provided by the property owners and is completely at their discretion. Your access to the network may be blocked, suspended, or terminated at any time for any reason.
(*) You agree not to use the wireless network for any purpose that is
Redirection
Redirect to the URL that the user intends to visit.
Redirect to the following URL:
Apply
Guest Pass Generation

2 Under *Enable Guest Access*, select the *Authentication* type to use:

- **Use guest pass authentication**: Redirect the user to a page requiring a valid guest pass before allowing the user to use the guest WLAN.

- If you want multiple guests to be able to use the same guest pass simultaneously, select the **Allow multiple users to share a single guest pass** check box.
- **No authentication**: Do not require redirection and guest pass validation.

3 Under *Terms of Use*, select the **Show terms of use** check box to compel the guest user to read and accept your terms of use prior to use. Type (or cut and paste) your terms of use into the large text box.

4 At *Redirect*, select one of the following radio buttons to use/not use redirection:

- **Go to the original URL the user intended to**: Allows the guest user to continue to their destination without redirection.
- **Redirect to the following URL**: Redirect the user to a specified Web page (entered into the text box) prior to forwarding them to their destination. When guest users land on the redirected page(s), they are shown the expiration time for their guest pass.

5 Click **Apply** to save your settings.

Managing Guest Pass Access

By default, all of your users are allowed to issue temporary “day use” guest passes for visitors and contractors. Such a guest pass allows its user to connect to the WLAN.

You must decide whether or not to permit all—or some—users to generate guest passes.

Additionally, you may also want to review the default settings and policies that control guest-pass use of the network. There are options you can fine-tune to fit your work environment.

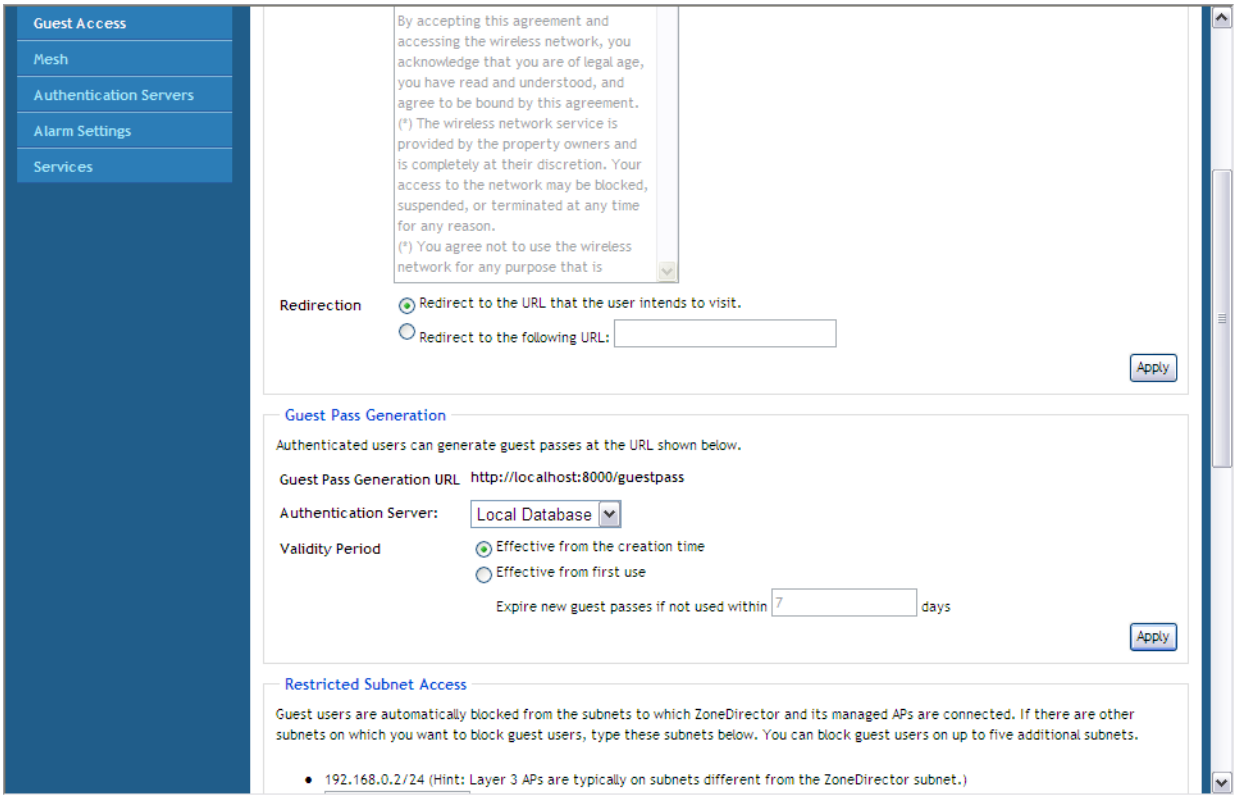
Activating Guest Pass Access in ZoneDirector

1 Go to **Configuration** > **Guest Access**.

The *Guest Access* page appears.

2 Scroll down to *Guest Access* > *Guest Pass Generation*.

FIGURE 4-5: The Guest Pass Generation section on the Guest Pass page


Guest Access
Mesh
Authentication Servers
Alarm Settings
Services
By accepting this agreement and accessing the wireless network, you acknowledge that you are of legal age, you have read and understood, and agree to be bound by this agreement.
(*) The wireless network service is provided by the property owners and is completely at their discretion. Your access to the network may be blocked, suspended, or terminated at any time for any reason.
(*) You agree not to use the wireless network for any purpose that is
Redirection
Redirect to the URL that the user intends to visit.
Redirect to the following URL:
Apply
Guest Pass Generation
Authenticated users can generate guest passes at the URL shown below.
Guest Pass Generation URL http://localhost:8000/guestpass
Authentication Server: Local Database
Validity Period
Effective from the creation time
Effective from first use
Expire new guest passes if not used within 7 days
Apply
Restricted Subnet Access
Guest users are automatically blocked from the subnets to which ZoneDirector and its managed APs are connected. If there are other subnets on which you want to block guest users, type these subnets below. You can block guest users on up to five additional subnets.
192.168.0.2/24 (Hint: Layer 3 APs are typically on subnets different from the ZoneDirector subnet.)

3 If you require a specific authentication server, toggle the *Authentication Server* drop-down list to select the appropriate server.

4 Set the guest pass expiration parameters by selecting the radio button by either of the following:

- **Guest Pass will expire in the amount of time specified after it is issued**: This type of guest-pass is valid from the time it is first created to the specified expiration time, even if it is not being used by any end user.
- **Guest Pass will expire in the amount of time specified after it is first used**: This type of guest pass is valid from the time the user uses it to authenticate with ZoneDirector until the specified expiration time. An additional parameter (**A Guest Pass will expire in X days**) can be configured to specify when an unused guest pass will expire regardless of use. The default is 7 days.

5 When you are finished, click **Apply** to save your settings and make this new policy active.

Controlling Guest Pass Generation Privileges

To disable the “guest pass” generation privilege granted to all basic “default” role users, follow these steps:

1 Go to **Configure** > **Roles**.

When the *Roles and Policies* page appears, a table lists all existing roles, including “Default”.

2 Click **Edit** (in the "Default" role row).

3 In the *Policies* options, clear the check box by **Allow Guest Pass Generation** (if this option is active).

4 Click **OK** to save your settings. Users with "default" roles no longer have guest-pass generation privileges.

Creating a Guest Pass Generation User Role

To create a guest-pass generator role that can be assigned to authorized users, follow these steps:

1 Go to **Configuration** > **Roles**.

2 In the *Roles* table, click **Create New**.

3 When the *Create New* features appear, make these entries:

Name	Enter a name for this role.
Description	Enter a short description of this role's application.
Group Attributes	This field is only available if you choose Active Directory as your authentication server. Enter the Active Directory User Group names here. Active Directory users with the same group attributes are automatically mapped to this user role.
Allow All WLANs	You have two options: (1) allow all users with this role to connect to all WLANs, or (2) limit this role's users to specific WLANs, and then pick the WLANs they can connect to.
Guest Pass	If you want users with this role to have permission to generate guest passes, check this option.

4 Click **OK** to save your settings. This new role is ready for application to authorized users.

Assigning a Pass Generator Role to a User Account

This procedure details the procedure for assigning a guest-pass generator role to a user account.

1 Go to **Configuration** > **User**.

2 At the bottom of the *Internal Users Database*, click **Create New**.

3 When the *Create New* form appears, fill in the text fields with the appropriate entries.

4 Open the **Role** menu and choose the assigned role for this user.

NOTE You can edit an existing user account and reassign the pass-generator role, if you prefer.

5 Click **OK** to save your settings. Be sure to communicate the role, user name and password to the appropriate end user.

Monitoring Generated Guest Passes

Once you have generated a pass for a guest, you can monitor and (if necessary) remove it.

1 Go to **Monitor > Generated Guest Passes**.

2 View generated guest passes.

3 To remove a guest pass, select the check box for the guest pass.

4 Click the **Delete** button.

Restricting Guest Subnet Access

The *Guest Pass > Restricted Subnet Access* feature enables you to restrict guest access to specified subnets. By default, guest pass users are automatically blocked from ZoneDirector subnet (192.168.0.2/24) and the subnet of the AP to which the guest user is connected.

You can configure up to 5 IP subnets to be blocked to guest access. This subnet access policy is enforced both on the ZoneDirector side (for tunneled/redirect traffic) and the AP side (for local-bridging traffic).

NOTE All guests share this same subnet access policy.

To prevent guests from accessing certain subnets:

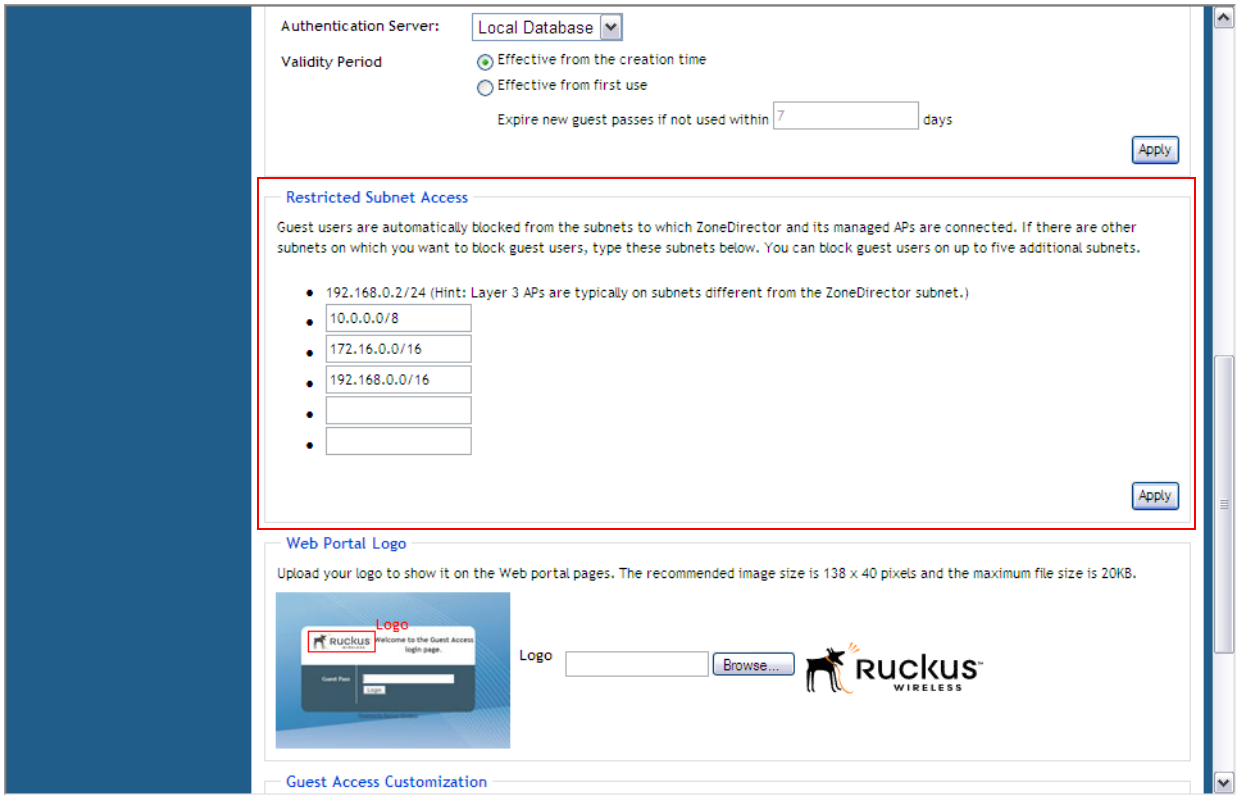
1 Go to **Configure > Guest Access**.

2 Under *Restricted Subnet Access*, type the IP address and subnet mask (format: A.B.C.D/M) of the subnet in a provided text field. See FIGURE 4-6.

3 Repeat Step 2 to add additional subnets (up to five).

4 Click **Apply** to enforce your settings.

FIGURE 4-6: The Restricted Subnet Access options


Authentication Server:
Local Database
Validity Period
Effective from the creation time
Effective from first use
Expire new guest passes if not used within 7 days
Apply
Restricted Subnet Access
Guest users are automatically blocked from the subnets to which ZoneDirector and its managed APs are connected. If there are other subnets on which you want to block guest users, type these subnets below. You can block guest users on up to five additional subnets.
192.168.0.2/24 (Hint: Layer 3 APs are typically on subnets different from the ZoneDirector subnet.)
10.0.0.0/8
172.16.0.0/16
192.168.0.0/16
Apply
Web Portal Logo
Upload your logo to show it on the Web portal pages. The recommended image size is 138 x 40 pixels and the maximum file size is 20KB.
Logo
Logo
Browse...
Ruckus
WIRELESS
Guest Access Customization

Activating Web Authentication of Users

Web authentication, when activated on an WLAN, compels all users to log in to a specific WLAN every time they connect. This is helpful if you are managing an Internet hotzone.

After you activate Web authentication on your hotzone/hotspot WLAN, you must then provide all users with a URL to your login page. Of course the users must be listed in an internal or external authentication database. After they discover the WLAN on their wireless device or laptop, they open their browser, connect to the Login page and enter the required login information.

1 Go to **Configure** > **WLANs**.

2 When the *WLANs* page appears, click the **Edit** link in the row of the relevant WLAN record.

3 When the *Editing* (*WLAN_Name*) form appears, locate the *Web Authentication* option. See "FIGURE 4-7" on page 72.

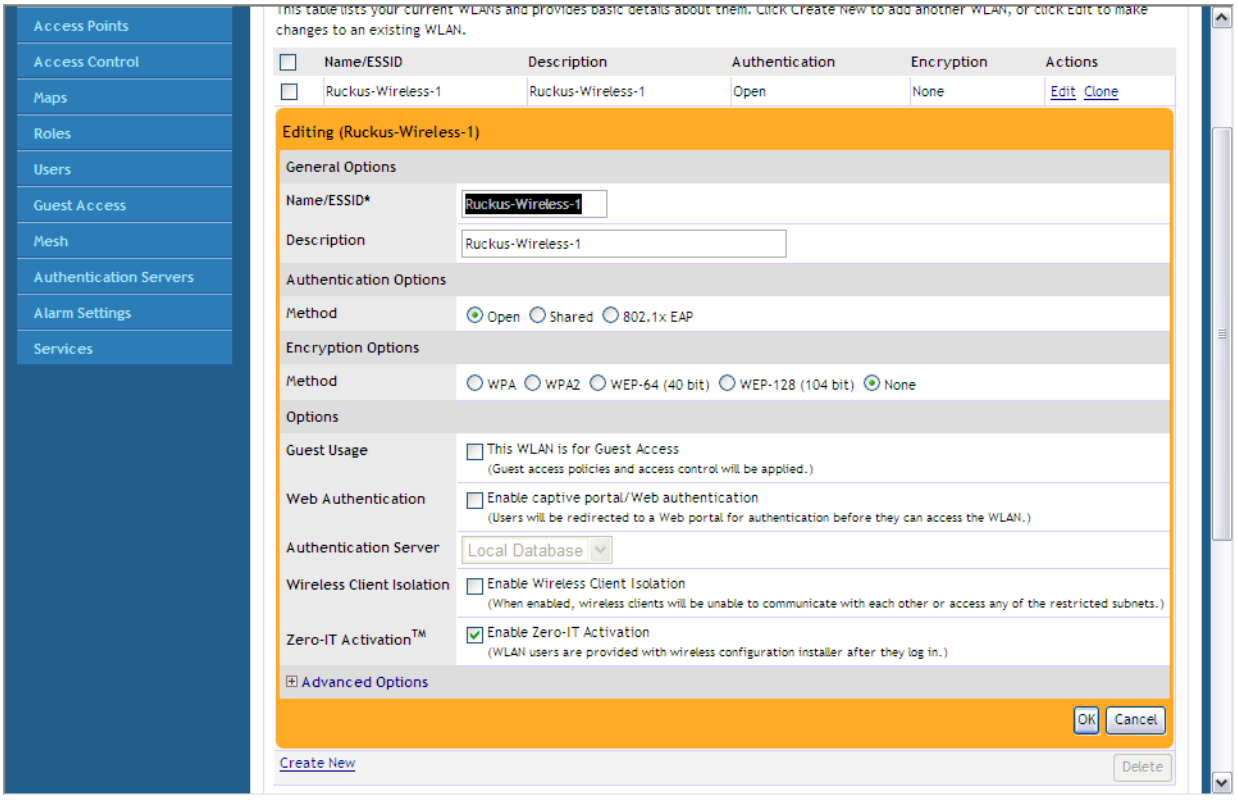
4 Click the check box to enable portal/Web authentication.

5 Select the preferred authentication server (for Web Authentication) from the *Authentication Server* drop-down menu.

6 Click **OK** to save this entry.

7 Repeat this "enabling" process for each WLAN to which you want to apply Web authentication.

FIGURE 4-7: The Edit WLAN page



Managing Automatically Generated User Certificates and Keys

With Ruckus Zero-IT wireless activation, a unique key or certificate is automatically generated for a user during the activation process. More precisely, for a WLAN configured with WPA-PSK/WPA2-PSK and Dynamic PSK enabled, a unique and random key phrase is generated for each wireless user. Similarly, for a WLAN configured with 802.1X/EAP authentication, a unique certificate for each wireless user is created. When using the internal user database, automatically generated user certificates and keys are deleted whenever the associated user account is deleted from the user database. In the case of using Windows Active Directory Server or a RADIUS server as an authentication server, you can delete the generated user keys and certificates by following these steps:

1 Go to **Monitor** > **Generated PSK/Certs**.

2 When the *Generated PSK/Certs* page appears, click on the check boxes next to the PSKs and Certificates you like to delete.

3 Click **Delete** to delete the selected items.

The selected PSKs and Certificates are deleted from the system.

A user with a deleted PSK or a deleted certificate will not be able to connect to the wireless network without obtaining a new key or a new certificate.

CHAPTER 5

Deploying a Wireless Mesh Network

Chapter Contents

- *"Overview of Wireless Mesh Networking"* 75
- *"Mesh Networking Terms"* 75
- *"Supported Mesh Topologies"* 76
- *"Deploying a Wireless Mesh via ZoneDirector"* 78
- *"Understanding Mesh-related AP Statuses"* 83
- *"Setting Mesh Uplinks Manually"* 83
- *"Troubleshooting Isolated Mesh APs"* 85

Overview of Wireless Mesh Networking

A wireless mesh network is a peer-to-peer, multi-hop wireless network wherein participant nodes cooperate to route packets. In a Ruckus wireless mesh network, the routing nodes (i.e., the Ruckus APs forming the network), or “mesh nodes”, form the network's backbone. Clients (e.g., laptops, mobile devices) connect to the mesh nodes and use the backbone to communicate with one another, and, if permitted, with nodes on the Internet. The mesh network enables clients to reach other systems by creating a path that 'hops' between nodes.

Mesh networking offers many advantages. Mesh networks are self-healing: If any one of the nodes fails, the nodes note the blockage and re-route data. Wireless mesh networks are self-organizing: When a new node appears, it becomes assimilated into the mesh network.

In the Ruckus mesh network, all traffic going through the mesh links is encrypted. A passphrase is shared between mesh nodes to securely pass traffic.

When deployed as a mesh network, Ruckus Wireless APs communicate with ZoneDirector through a wired LAN connection or through wireless LAN connection with other Ruckus Wireless access points.

Mesh Networking Terms

Before you begin deploying your wireless mesh network, Ruckus Wireless recommends getting familiar with the following terms that are used in this document to describe wireless mesh networks.

Table 1: Mesh Networking Terms

Term	Definition
Mesh Node	A Ruckus ZoneFlex AP with mesh capability enabled. ZoneFlex models that provide mesh capability include ZoneFlex 2942, ZoneFlex 7942, and ZoneFlex 2925.
Root Access Point (Root AP)	A mesh node communicating to a ZoneDirector through its Ethernet (that is, wired) interface.
Mesh Access Point (Mesh AP)	A mesh node communicating to a ZoneDirector through its wireless interface.
Mesh Tree	Each Mesh AP has exactly one uplink to another Mesh AP or Root AP. Each Mesh AP or Root AP could have multiple Mesh APs connecting to it. Thus, the resulting topology is a tree-like topology. There is no configurable limit to the depth of a mesh tree. A single ZoneDirector device can manage more than one mesh tree. The only limitation of how many mesh trees it can manage is dependent on the number of APs a ZoneDirector can manage. For example, a ZD1006 can manage a mesh tree of 6 APs or two mesh trees of 3 APs each.

Table 1: Mesh Networking Terms

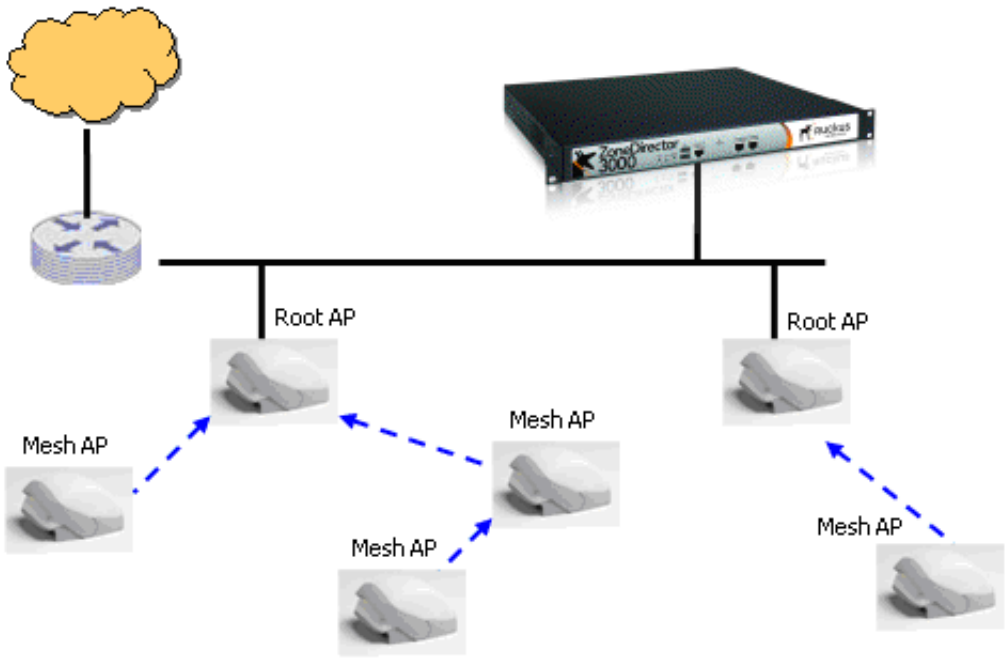
Term	Definition
Hop	The number of wireless mesh links a data packet takes from one Mesh AP to the Root AP. For example, if the Root AP is the uplink of Mesh AP 1, then Mesh AP 1 is *one* hop away from the Root AP. In the same scenario, if Mesh AP 1 is the uplink of Mesh AP 2, then Mesh AP 2 is *two* hops away from the Root AP.

Supported Mesh Topologies

Standard Topology

If you need to extend the coverage of your wireless network, you can set up a mesh network using the standard topology. In this topology, ZoneDirector and the upstream router are connected to the same wired LAN segment. You can extend the reach of your wireless network by forming and connecting multiple mesh trees (see FIGURE 5-1) to the wired LAN segment. All of the clients in each mesh tree function as wireless clients.

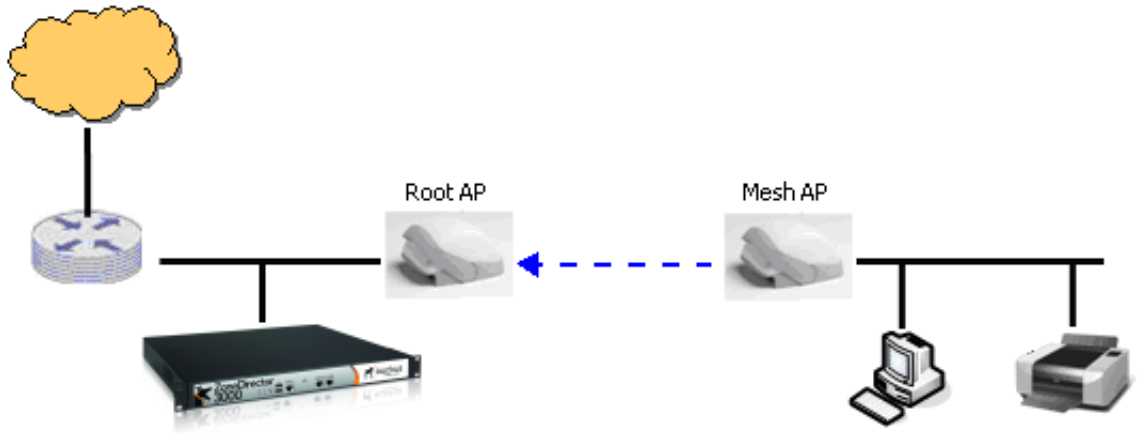
FIGURE 5-1: Mesh - Standard Topology



Wireless Bridge Topology

If you need to bridge isolated wired LAN segments, you can set up a mesh network using the wireless bridge topology. In this topology, ZoneDirector and the upstream router are on the same wired LAN segment. You can bridge these two wired LAN segments by forming two intersecting mesh trees, as shown in FIGURE 5-2.

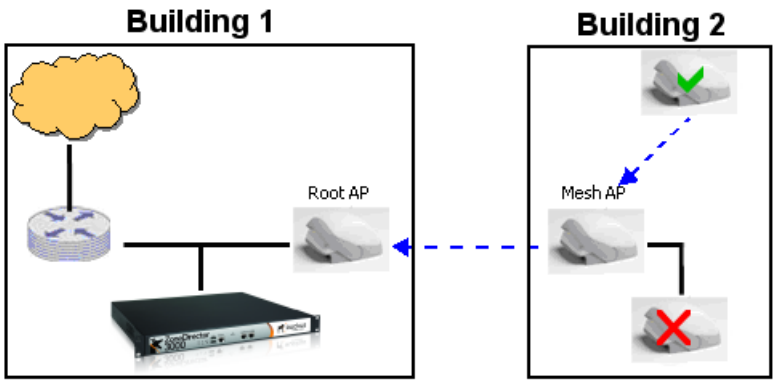
FIGURE 5-2: Mesh - Wireless Bridge Topology



Unsupported Mesh Topology

If you are deploying a building-to-building mesh, note that APs in the second building must all be Mesh APs (connected *wirelessly*). If any AP in the second building is connected to a Mesh AP via the *wired* network, it will assume that it is a Root AP and attempt to discover ZoneDirector via its Ethernet port. This could result in a network loop or unstable network performance.

FIGURE 5-3: APs in the second building must be connected wirelessly to form a mesh



Deploying a Wireless Mesh via ZoneDirector

Deploying a wireless mesh via ZoneDirector involves the following steps:

- *"Step 1: Prepare for Wireless Mesh Deployment"*
- *"Step 2: Enable Mesh Capability on ZoneDirector"*
- *"Step 3: Provision and Deploy Mesh Nodes"*
- *"Step 4: Verify That the Wireless Mesh Network Is Up"*

Step 1: Prepare for Wireless Mesh Deployment

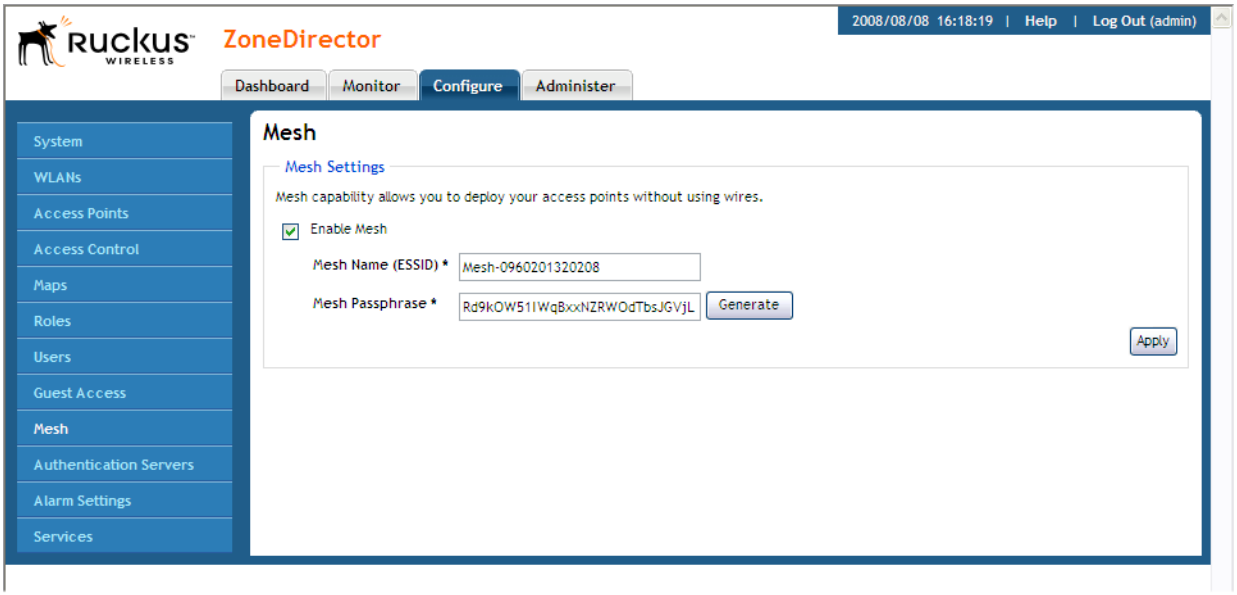
Before starting with your wireless mesh deployment, Ruckus Wireless recommends performing a number of tasks that can help ensure a smooth deployment.

- **Plan Your Wireless Mesh Network** - Survey your deployment site, decide on the number of APs that you will deploy (including the number of Root APs and Mesh APs), and then create a simple sketch of where you will deploy each Root AP and Mesh AP. Remember that Root APs need to be connected to ZoneDirector via their Ethernet ports. Make sure that the Root AP locations can be wired easily, if cabling is not yet available.
- **Make Sure That Your Access Points Support Mesh Networking** - ZoneFlex models that provide wireless mesh networking support include ZoneFlex 2942, ZoneFlex 7942, and ZoneFlex 2925. Verify that the access points that you are planning to include in your wireless mesh network all provide mesh capability. Note that only firmware versions 6.0.0.0.* and above (for both ZoneFlex and ZoneDirector) support mesh networking.
- **Enable Auto Approval** - If you do not want to have to manually approve the join request from each mesh AP when they start forming the wireless mesh, you can enable **Auto Approval**. For instructions on how to enable Auto Approval, see *"Adding New Access Points to the WLAN"* on page 52.

Step 2: Enable Mesh Capability on ZoneDirector

If you did not enable mesh capability on ZoneDirector when you completed the Setup Wizard, you can enable it on the **Configure** > **Mesh** page.

FIGURE 5-4: Enable Mesh in Configure > Mesh



To enable mesh capability:

1 Log in to the ZoneDirector Web interface.

2 Click the **Configure** tab.

3 On the menu, click **Mesh**.

4 Under **Mesh Settings**, select the **Enable Mesh** check box.

5 In **Mesh Name (ESSID)**, type a name for the mesh network. Alternatively, do nothing to accept the default mesh name that ZoneDirector has generated.

6 In **Mesh Passphrase**, type a passphrase that contains at least 12 characters. This passphrase will be used by ZoneDirector to secure the traffic between Mesh APs. Alternatively, click **Generate** to generate a random passphrase with 32 characters or more.

7 Click **Apply** to save your settings.

You have completed enabling mesh capability on ZoneDirector. You can now start provisioning and deploying the APs that you want to be part of the wireless mesh network.

Step 3: Provision and Deploy Mesh Nodes

In this step, you will connect each AP to the same wired network as ZoneDirector to provision it with mesh-related settings. After you complete provisioning an AP, you must reboot it for the mesh-related settings to take effect.

To provision and deploy a mesh node:

1 Using one of the AP's Ethernet ports, connect it to the same wired network to which ZoneDirector is connected, and then power it on. The AP detects ZoneDirector and sends a join request.

2 If Auto Approval is enabled, continue to Step 3. If Auto Approval is disabled, log in to ZoneDirector, check the list of currently active access points for the AP that you are attempting to provision, and then click the corresponding **Allow** link to approve the

join request. For detailed procedures on approving join requests, see *"Verifying/ Approving New APs"* on page 52.

3 After the AP has been provisioned, disconnect it from the wired network, unplug the power cable, and then move the device to its deployment location.

- If you want the AP to be a Root AP, reconnect it to the wired network using one of its Ethernet ports, and then power it on. When the AP detects ZoneDirector again through its Ethernet port, it will set itself as a Root AP, and then it will start accepting mesh association requests from Mesh APs.
- If you want the AP to be a Mesh AP, power it on but do not reconnect it to the wired network. When it does not detect ZoneDirector through its Ethernet port within 90 seconds, it will search for other Mesh APs and, once mesh neighbor relationships are established, form a mesh tree.

IMPORTANT	After an AP in its factory default state has been provisioned, you need to reboot it to enable mesh capability.

Repeat Steps 1 to 3 for each Mesh AP and Root AP that you want to be part of your wireless mesh network. After you complete provisioning and deploying all mesh nodes, verify that the wireless mesh has been set up successfully.

Step 4: Verify That the Wireless Mesh Network Is Up

After you complete deploying all mesh nodes to their locations on the network, you can check the Map View on the ZoneDirector Web interface to verify that mesh associations have been established and mesh trees formed.

1 On the Zone Director Web interface, click the **Monitor** tab, and then click **Map View** on the menu. The Map View appears and shows the mesh nodes that are currently active.

2 Check if all the mesh nodes that you have provisioned and deployed appear on the Map View.

3 Verify that a mesh network has been formed by checking if dotted lines appear between the mesh nodes. These dotted lines identify the neighbor relationships that have been established in the current mesh network.

FIGURE 5-5: Dotted lines indicate that these APs are part of the wireless mesh network

The symbols next to the AP icons indicate whether the AP is a Root AP or a Mesh AP. Refer to the following table:

	An AP with the upward pointing arrow is a Root AP.
	An AP with a number in a circle is a Mesh AP. The number indicates the number of hops from the mesh AP to the Root AP.

Using the ZoneFlex LEDs to Determine the Mesh Status

In addition to checking the mesh status of ZoneFlex APs from the ZoneDirector Web interface, you can also check the LEDs on the APs. The two LEDs on the ZoneFlex AP that indicate mesh status are:

- WLAN/Wireless Device Association LED - Indicates downlink status and client association status
- Signal/Air Quality LED - Indicates uplink status and the quality of the AP's wireless signal

WLAN/Wireless Device Association LED

The behavior of the WLAN LED is the same on both Root AP and Mesh AP. Refer to the table below for a complete list of possible LED colors and behaviors for Root APs and Mesh APs, and the mesh status that they indicate.

LED Color/Behavior	Root AP / Mesh AP
Green	• No mesh downlink, and; • At least one client is associated with the AP
Amber	• No mesh downlink, and; • No client is associated with the AP
Fast blinking green	• At least one mesh downlink exists, and; • At least one client is associated with the AP
Slow blinking green	• At least one mesh downlink exists, and; • No client is associated with the AP

Signal/Air Quality LED

LED Color/Behavior	Root AP	Mesh AP
Solid green	N/A	• Connected to a Root AP or another Mesh AP • Signal quality is good
Fast blinking green	N/A	• Connected to a Root AP or another Mesh AP • Signal quality is fair
Slow blinking green	N/A	AP is searching for an uplink
Off	This AP is a Root AP	N/A

Understanding Mesh-related AP Statuses

In addition to using the Map View to monitor the status of the mesh network, you can also check the Access Points page on the Monitor tab for mesh-related AP statuses. The table below lists all possible AP statuses that are related to mesh networking, including any actions that you may need to perform to resolve mesh-related issues.

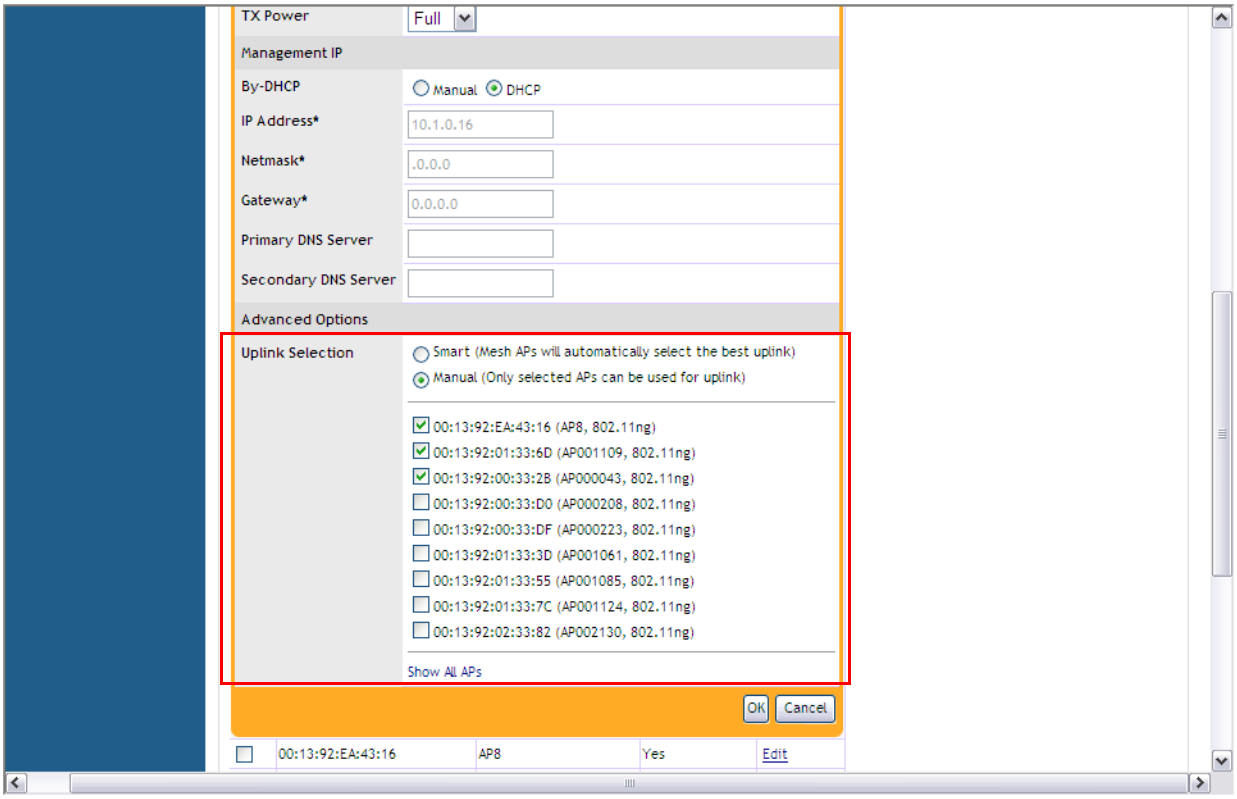
Status	Description	Recommended Action
Connected	AP is connected to ZoneDirector, but mesh is disabled	If mesh is enabled on the AP, you may need to reboot it to activate the mesh.
Connected (Root AP)	AP is connected to ZoneDirector via its Ethernet port	
Connected (Mesh AP, n hop)	AP is connected to ZoneDirector via its wireless interface and is *n* hops away from the Root AP.	
Isolated Mesh AP	AP is disconnected from the ZoneDirector mesh	• The AP may be configured incorrectly. Verify that the mesh SSID and passphrase configured on the AP are correct. • If Uplink Selection is set to Manual, the uplink AP specified for this AP may be off or unavailable.

Setting Mesh Uplinks Manually

In a wireless mesh network, the default behavior of Mesh APs is to connect automatically to a mesh node (either Mesh AP or Root AP) that provides the highest throughput. This automatic connection is called *Smart Uplink Selection*.

If you want to shape your mesh network or force a certain topology, you will need to disable **Smart Uplink Selection** and manually set the mesh nodes to which an AP can connect.

FIGURE 5-6: Setting Uplink Selection to Manual



To set the mesh uplink for an AP manually:

1 On the ZoneDirector Web interface, click the **Configure** tab.

2 On the menu, click **Access Points**.

3 In the Access Points table, find the AP you want to restrict, and click **Edit** under the **Actions** column. The editing form appears below your selection.

4 Under **Advanced Options** > **Uplink Selection**, select the **Manual** radio button. The other APs in the mesh appear below the selection.

5 Select the check box for each AP that the current AP can use as uplink.

NOTE

If you set Uplink Selection for an AP to Manual and the uplink AP that you selected is off or unavailable, the AP status on the Monitor > Access Points page will appear as *Isolated Mesh AP*.

6 Click **OK** to save your settings.

Troubleshooting Isolated Mesh APs

Isolated Mesh APs are those that were once managed by ZoneDirector but are now unreachable. They are up and running and constantly searching for mesh uplinks, but are unable to connect to any root AP. You can check if you have any isolated mesh APs on the network by checking the **Monitor** tab > **Access Points** page.

NOTE

A mesh network is dynamic in nature. Before attempting to resolve any mesh-related issue, please wait 15 minutes to allow the mesh network to stabilize. Some mesh-related issues are automatically resolved once the mesh network stabilizes.

Understanding Isolated Mesh AP Statuses

There are five possible reasons for a mesh AP to become isolated. The table below lists all possible Isolated Mesh AP statuses that may appear on the **Monitor** > **Access Points** page, and provides possible reasons for the isolation and the recommended steps for resolving the issue.

Status	Possible Reason
No APs in manual uplink selection	You have set uplink selection to Manual, but none of the uplink APs you specified is available or reachable. To resolve this, go to the Configure > Access Points page on the ZoneDirector Web interface, and then click SmartSelection.
No APs within hop-limit	The AP cannot find other APs within the internally defined hops. The hop limit mechanism helps ensure that mesh APs maintain a reasonable network performance. To resolve this, add additional wired APs between this isolated Mesh AP and the closest Root AP.
Searching for uplinks	The AP is still searching for uplinks. This is usually a temporary state and is typically resolved automatically within 15 minutes as the mesh network stabilizes. If there is a significant number of APs on the network, it might take longer for the AP to resolve this.
Config error	The AP attempted to establish the mesh uplink but was unsuccessful. If you recently updated the mesh SSID and passphrase, it is likely that your changes have not propagated correctly to this AP (for example, the AP was offline when you updated the mesh SSID and passphrase). To resolve this, follow the instructions in *"Recovering an Isolated Mesh AP"* on page 86.

Status	Possible Reason
No APs with matching radio type	The AP is unable to find another mesh AP with the same radio type. In the current version of Ruckus Wireless' SmartMesh technology, APs must use the same radio type to be able connect to each other via the mesh network. For example, an 802.11n Mesh AP will only connect to another 802.11n AP, and an 802.11b/g Mesh AP will only connect to another 802.11b/g AP. To resolve this, place additional wired APs or Mesh APs that use the same radio type near this AP.

Recovering an Isolated Mesh AP

To perform these procedures, you will need:

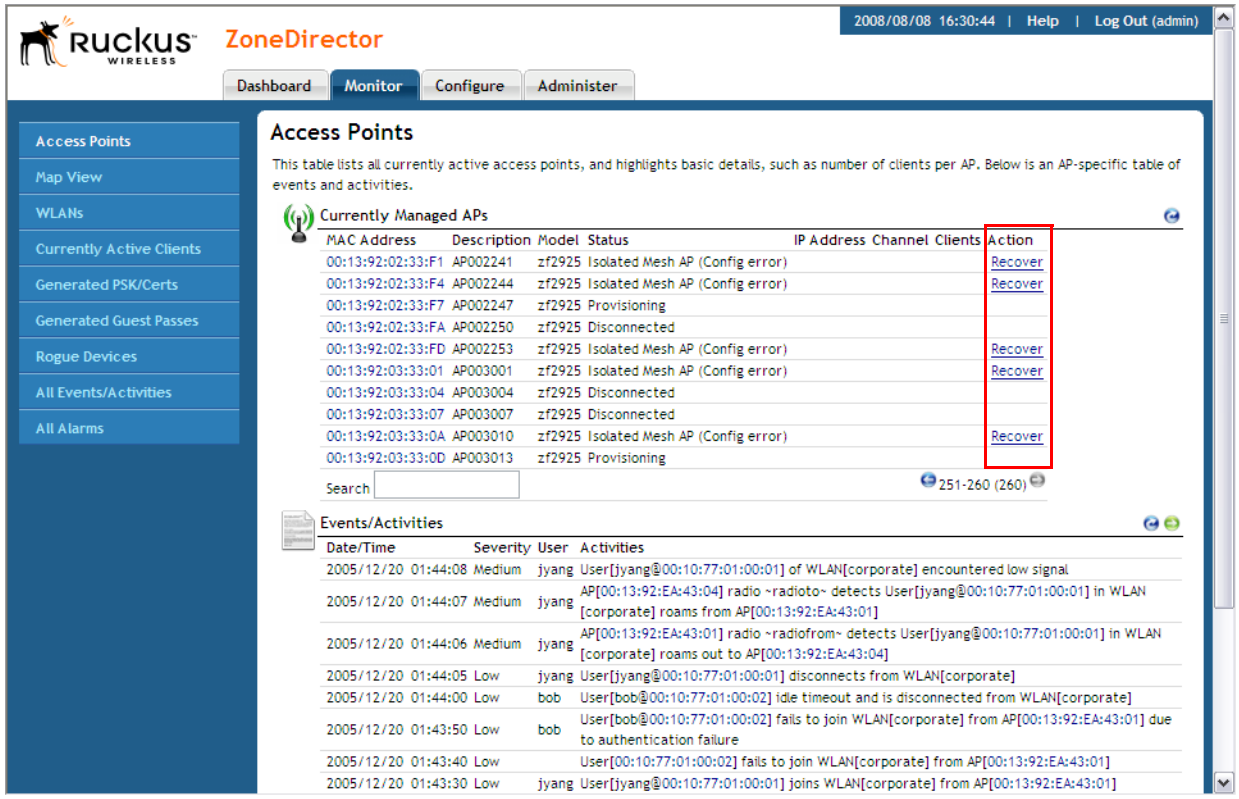
- A notebook computer with wireless capability. If you are running Windows XP on the computer, make sure that either the WPA2 patch or Service Pack 3 is installed.
- The last known mesh configuration for the AP (steps for obtaining this information are provided below).
- An SSH client, such as PuTTY and OpenSSH.

Step 1: Obtain the AP's Last Known Mesh Configuration

1 On the ZoneDirector Web interface, click the Monitor tab, and then click Access Points on the menu.

2 Under **Currently Managed APs**, look for the status message Isolated Mesh AP (Config error), and then click the **Recover** link that is on the same row.

FIGURE 5-7: Click Recover to obtain the AP's last known mesh configuration


Ruckus WIRELESS
ZoneDirector
2008/08/08 16:30:44 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
Access Points
Map View
WLANs
Currently Active Clients
Generated PSK/Certs
Generated Guest Passes
Rogue Devices
All Events/Activities
All Alarms
Access Points
This table lists all currently active access points, and highlights basic details, such as number of clients per AP. Below is an AP-specific table of events and activities.
Currently Managed APs
MAC Address Description Model Status IP Address Channel Clients Action
00:13:92:02:33:F1 AP002241 zf2925 Isolated Mesh AP (Config error) Recover
00:13:92:02:33:F4 AP002244 zf2925 Isolated Mesh AP (Config error) Recover
00:13:92:02:33:F7 AP002247 zf2925 Provisioning
00:13:92:02:33:FA AP002250 zf2925 Disconnected
00:13:92:02:33:FD AP002253 zf2925 Isolated Mesh AP (Config error) Recover
00:13:92:03:33:01 AP003001 zf2925 Isolated Mesh AP (Config error) Recover
00:13:92:03:33:04 AP003004 zf2925 Disconnected
00:13:92:03:33:07 AP003007 zf2925 Disconnected
00:13:92:03:33:0A AP003010 zf2925 Isolated Mesh AP (Config error) Recover
00:13:92:03:33:0D AP003013 zf2925 Provisioning
Search
251-260 (260)
Events/Activities
Date/Time Severity User Activities
2005/12/20 01:44:08 Medium jyang User[jyang@00:10:77:01:00:01] of WLAN[corporate] encountered low signal
2005/12/20 01:44:07 Medium jyang AP[00:13:92:EA:43:04] radio ~radioto~ detects User[jyang@00:10:77:01:00:01] in WLAN [corporate] roams from AP[00:13:92:EA:43:01]
2005/12/20 01:44:06 Medium jyang AP[00:13:92:EA:43:01] radio ~radiofrom~ detects User[jyang@00:10:77:01:00:01] in WLAN [corporate] roams out to AP[00:13:92:EA:43:04]
2005/12/20 01:44:05 Low jyang User[jyang@00:10:77:01:00:01] disconnects from WLAN[corporate]
2005/12/20 01:44:00 Low bob User[bob@00:10:77:01:00:02] idle timeout and is disconnected from WLAN[corporate]
2005/12/20 01:43:50 Low bob User[bob@00:10:77:01:00:02] fails to join WLAN[corporate] from AP[00:13:92:EA:43:01] due to authentication failure
2005/12/20 01:43:40 Low User[00:10:77:01:00:02] fails to join WLAN[corporate] from AP[00:13:92:EA:43:01]
2005/12/20 01:43:30 Low jyang User[jyang@00:10:77:01:00:01] joins WLAN[corporate] from AP[00:13:92:EA:43:01]

A page appears, which shows the AP's last known mesh configuration. Mesh information that appears on this page includes:

- AP's MAC Address
- Last Known Mesh SSID (mesh name)
- Last Known Mesh PSK (mesh passphrase)

3 Write down these details on a piece of paper. You will need them later in the next procedure.

Step 2: Set Up Your Computer for Wireless Connection to the AP

1 Assign the following static IP address settings to your computer:

- IP Address: 192.168.54.34
- Mask: 255.255.255.252

2 Create a wireless network from your computer. If you are running Windows XP, you can use the Wireless Network Setup Wizard to create the wireless network. Configure the wireless network with the following settings:

- Association mode: WPA2
- Encryption method: AES
- SSID: Type the AP's last known SSID (which you obtained in the previous section)
- PSK: Type the AP's last known PSK (which you obtained in the previous section)

Step 3: Connect to the AP and Update its ESSID and Passphrase

1 After you create the wireless network, position the computer close enough to the AP to allow association.

2 After your computer has associated with the AP, start the SSH client, and then connect to 192.168.54.33 (the AP's IP address).

3 Log in to the AP via SSH using the same user name and password that you use to log in to the ZoneDirector Web interface.

4 Enter the command `set meshcfg ssid "current_ssid"`, where current_ssid is the SSID that the mesh network is currently using.

5 Enter the command `set meshcfg passphrase "current_passphrase"`, where current_passphrase is the passphrase or PSK that the mesh network is currently using.

6 Close the SSH client.

You have completed recovering the isolated mesh AP. You should be able to manage this AP again shortly. Please wait at least 15 minutes (to allow the mesh network to stabilize), and then try managing this AP again via ZoneDirector.

CHAPTER 6

Monitoring Your Wireless Network

Chapter Contents

- *"Reviewing the ZoneDirector Monitoring Options"* 90
- *"Importing a Map View Floorplan Image"* 90
- *"Using the Map View Tools"* 92
- *"Reviewing Current Alarms"* 94
- *"Reviewing Recent Network Events"* 96
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- *"Detecting Rogue Access Points"* 97
- *"Evaluating and Optimizing Network Coverage"* 100
- *"Customizing Background Radio Frequency Scans"* 100

Reviewing the ZoneDirector Monitoring Options

The following highlights key ZoneDirector tab options and what you can do with them.

Dashboard Every time you log in to ZoneDirector via the Web interface, this collection of status surveys appears. Use it as your regular network-monitoring starting point. Data are blue-colored links that you can use to further drill down to focus on particular activities or devices.

Monitor The Map View provides a fast scan of key network factors: APs (legitimate, neighboring and rogue), client devices, and radio frequency (RF) coverage. You can see what devices are where in your floorplan, and visually evaluate network coverage.

Other Monitor tab options incorporated in the left column's buttons provide numeric data on WLAN performance and individual device activity. As with Dashboard, some data entries are links that take you to more detailed information. And, finally, the All Events log displays the most recent actions by users, devices and network, in chronological order.

Configure Use the options in this tab to assess the current state of WLAN users, any restricted WLANs, along with the settings for guest access, user roles, etc. You can also combine this tab's options with those in the Administer tab to perform system diagnostics and other preventive tasks.

Importing a Map View Floorplan Image

If your Ruckus ZoneDirector does not display a floorplan for your worksite when you open the Monitor tab Map View, you can import a floorplan and place AP markers in relevant locations by following these steps.

There is no limit on the number of floor maps that can be imported. There is a limit on the total size of all floor maps that are imported to the system: 2MB (an error message displays if the total size of floor maps is more than 2MB).

Requirements

- A floorplan image in .GIF, .JPG or .PNG format
- The image should be monochrome or grayscale
- The file size should be no larger than 200Kb in size
- The floorplan image should be (ideally) no larger than 10 inches (720 pixels) per side.

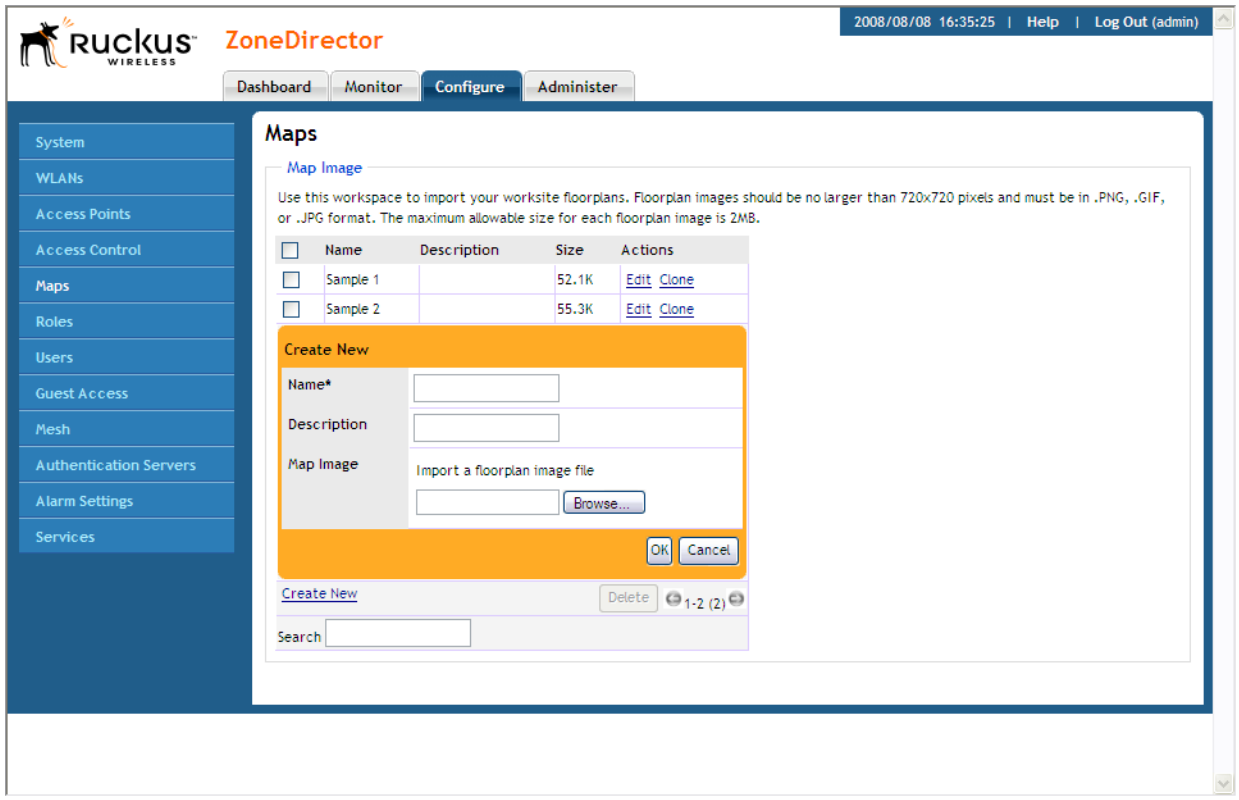
Importing the Floorplan Image

1 Go to **Configure** > **Maps**. The Maps page appears.

2 Click **Create New**. The Create New form appears.

3 In **Name**, type a name to assign to the floorplan image that you will be importing. Type a description as well, if preferred.

FIGURE 6-1: The Create New form for importing a floorplan image



4 Click **Browse**. The Choose File dialog box appears.

5 Browse to the location of the floorplan image file, select the file, and then click Open to import it. If the import is successful, a thumbnail version of the floorplan will appear in the *Current Image* area.

6 Go to **Monitor > Map View** to see this image.

You can now use the Map View to place the Access Point markers.

Placing the Access Point Markers

After using the **Configure > Maps** options to import your floorplan image, you can use the Monitor tab's Map View to distribute markers that represent the APs to the correct locations. This will give you a powerful monitoring tool.

TIP	If you have imported multiple floor plans representing multiple floors in your building(s), make sure you place the access point markers on the correct floorplan.

1 Have the list of APs handy, with MAC addresses and locations.

2 Go to **Monitor > Map View** (if it's not already in view).

3 Look in the upper left corner for AP marker icons. There should be one for each AP, with a tiny red question mark at the top.

4 Look at the MAC address notation under the marker icon, to identify a marker.

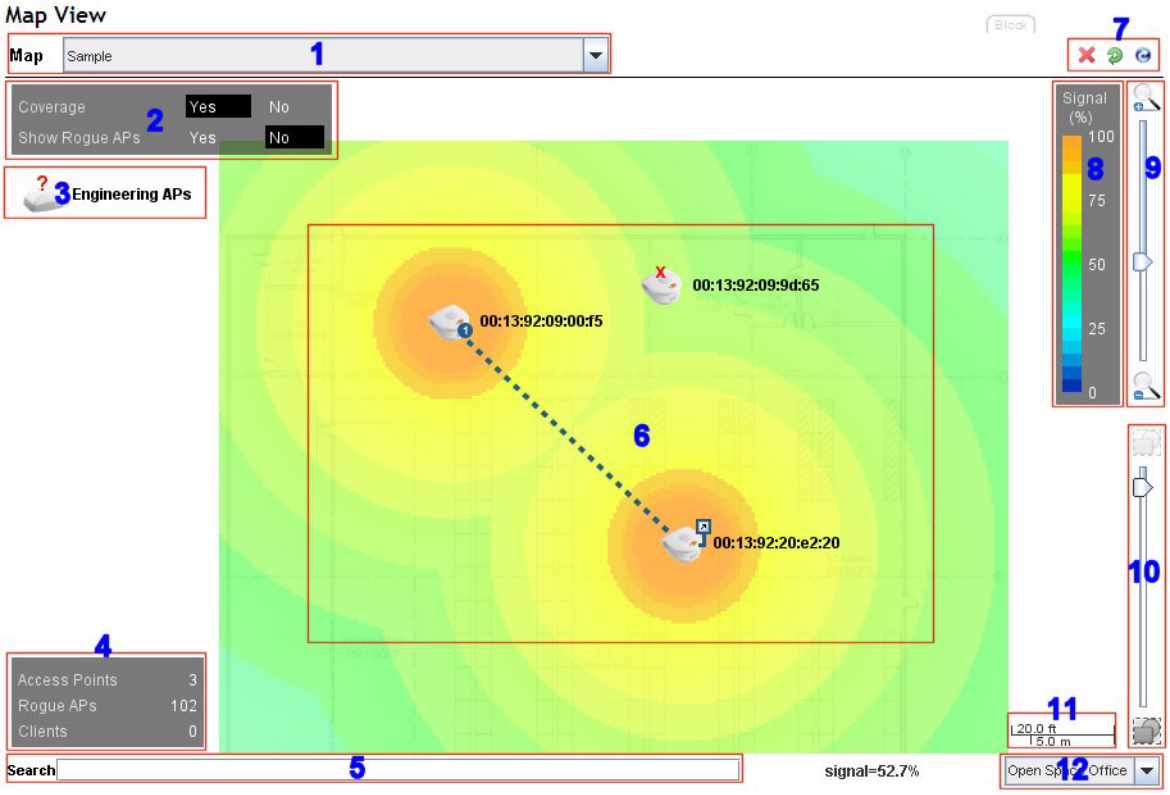
5 Drag each marker icon from the upper left corner into its correct location on the floor-plan.

When you are finished, you can make immediate use of the Map View to optimize your wireless coverage, as detailed in *"Optimizing Access Point Performance"* on page 59.

Using the Map View Tools

If your worksite floorplan has been scanned in and mapped with APs, the *Map View* will display a graphical image of your physical Ruckus network AP distribution.

FIGURE 6-2



There are a number of helpful features built into the Map View, as noted here and marked in the above illustration:

1 **Map** drop-down list: Select the floorplan to view from the Map drop-down list.

2 **Coverage** and **Show Rogue APs** box: For Coverage, selecting Yes enables a signal strength view of your placed APs. This opens the Signal (%) legend on the right side of the Map View. See item number 8 below for the description of the Signal %. For Show Rogue APs, selecting Yes displays the detected rogue APs in the floorplan.

3 Unplaced APs area: As noted in Importing a Map View Floorplan Image, when you first open the Map View, newly placed APs appear in this area. If they are approved for use (see *"Adding New Access Points to the WLAN"* on page 52), you can drag them into the correct location in the floorplan. Unplaced APs are available across all of the floor plans you upload. Thus, you can toggle between maps (see number 1) and place each AP on the appropriate map. For the various AP icon types, see *"AP Icons"* on page 94.

4 **Access Points**, **Rogue APs**, and **Clients** box: This lower left corner box displays the number of active APs, any rogue (unapproved or illegitimate) APs, and all associated clients.

5 **Search** text box: Enter a string, such as part of an AP's name or MAC address, and the map is filtered to show only the matching results. Clearing the search value returns the map to its unfiltered view.

6 Floorplan area: The floorplan displays in this main area. You can manipulate the size and angle of the floorplan by using the tools on this screen.

7 Note the following icons:

	Click this icon and then click an AP from the floorplan to remove that AP.
	Click this icon to rotate the floorplan. When clicked, rotation crosshairs appear in the center of the map; click and hold these crosshairs and move your cursor to rotate the view.
	Refresh the floorplan.

8 **Signal (%)**: This colored legend displays the signal strength coverage when you selected "Yes" for Coverage (see #2 above). See *"Evaluating and Optimizing Network Coverage"* on page 100 for more information.

9 Upper Slider: The upper slider is a zoom slider, allowing you to zoom in and out of the floorplan. This is helpful in exact AP marker placement, and in assessing whether physical obstructions that affect RF coverage are in place.

10 Lower slider: The bottom slider is the image contrast slider, allowing you to dim or enhance the presence of the floorplan. If you have trouble seeing the floorplan, move the slider until you achieve a satisfactory balance between markers and floorplan details.

11 Scale legend: To properly assess the distances in a floorplan, a scaler has been provided so that you can place APs in the most precise location. The scale works best when the floorplan view has not been zoomed in or out. The scale offers both feet and meters as units of measure. Use a physical object as a reference to the scale in order to judge distances on your floorplan. For example, cut a piece of paper to the length of the scale, and then use that piece of paper on the floorplan to measure off distance increments.

12 Open Space Office drop-down list: Open Office Space refers to the methodology used to compute RF coverage/signal % (i.e., heat map) based on the current environment.

AP Icons

Each AP marker has variable features that help indicate identity and status:

	A normal AP marker displays this devices' Ethernet MAC address below the icon. Above the icon is the "Users" count that shows the number of currently active client connections through this AP.
	An unplaced AP marker displays a "?" (question mark) above the icon.
	A rogue AP displays a smaller red icon imprinted with a "bug".
	An isolated AP displays a red "X" above the icon.
	When the wireless mesh network is enabled, a circled number appears next to the AP icon to indicate that it is a Mesh AP. The number indicates the number of hops from this Mesh AP to the Root AP.
	When the wireless mesh network is enabled, a blue square with an arrow indicates that it is a Root AP with active downlinks. Dotted lines that connect this AP to other APs indicate the active downlinks.
	When the wireless mesh network is enabled, a gray square (dimmed) with an arrow indicates that it is a Root AP without any active downlinks.

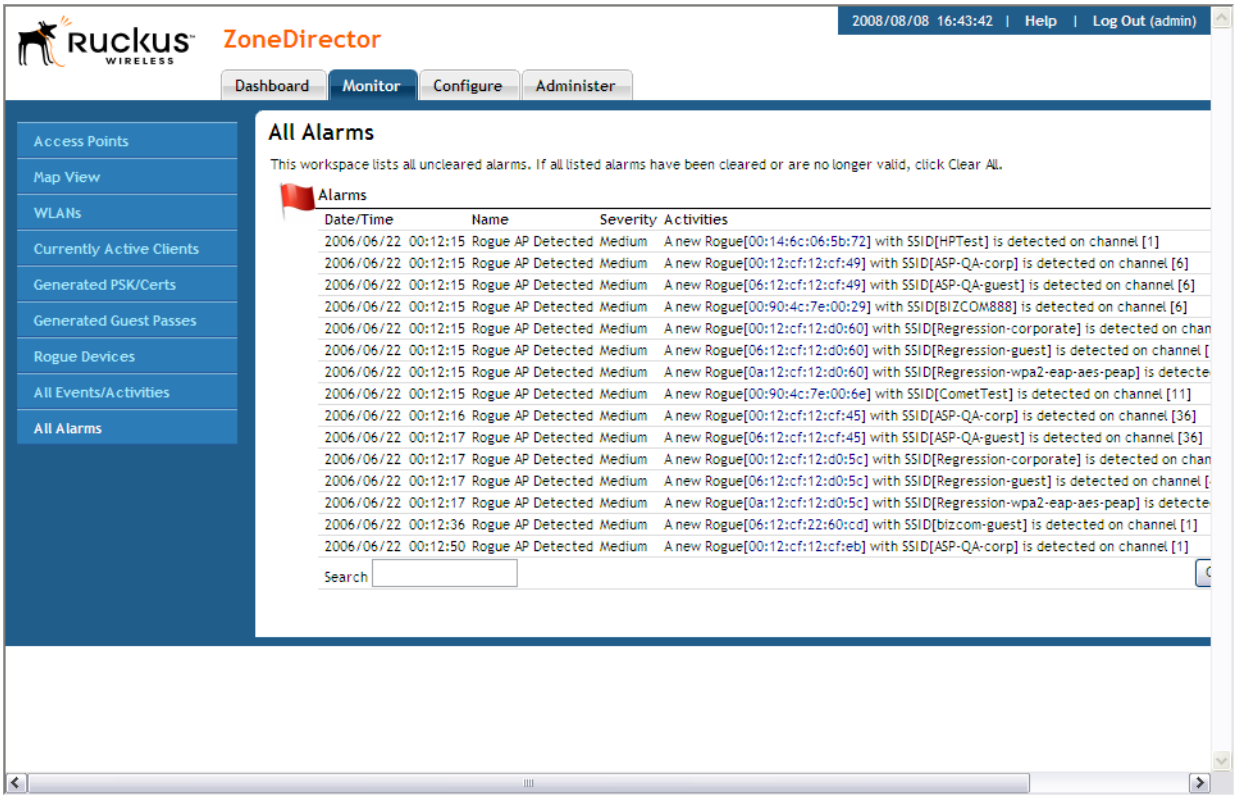
Reviewing Current Alarms

If an alarm condition is detected, ZoneDirector will record it in the events log, which, if configured, will send an email warning. To review the current alarms and clear all resolved alarm records, follow these steps:

1 Go to **Monitor** > **All Alarms**.

2 When the *All Alarms* page appears, the *Alarms* table lists the unresolved alarms, the most recent at the top.

FIGURE 6-3: The All Alarms page


Ruckus WIRELESS
ZoneDirector
2008/08/08 16:43:42 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
Access Points
Map View
WLANs
Currently Active Clients
Generated PSK/Certs
Generated Guest Passes
Rogue Devices
All Events/Activities
All Alarms
All Alarms
This workspace lists all uncleared alarms. If all listed alarms have been cleared or are no longer valid, click Clear All.
Alarms
Date/Time Name Severity Activities
2006/06/22 00:12:15 Rogue AP Detected Medium A new Rogue[00:14:6c:06:5b:72] with SSID[HPTest] is detected on channel [1]
2006/06/22 00:12:15 Rogue AP Detected Medium A new Rogue[00:12:cf:12:cf:49] with SSID[ASP-QA-corp] is detected on channel [6]
2006/06/22 00:12:15 Rogue AP Detected Medium A new Rogue[06:12:cf:12:cf:49] with SSID[ASP-QA-guest] is detected on channel [6]
2006/06/22 00:12:15 Rogue AP Detected Medium A new Rogue[00:90:4c:7e:00:29] with SSID[BIZCOM888] is detected on channel [6]
2006/06/22 00:12:15 Rogue AP Detected Medium A new Rogue[00:12:cf:12:d0:60] with SSID[Regression-corporate] is detected on chan
2006/06/22 00:12:15 Rogue AP Detected Medium A new Rogue[06:12:cf:12:d0:60] with SSID[Regression-guest] is detected on channel [
2006/06/22 00:12:15 Rogue AP Detected Medium A new Rogue[0a:12:cf:12:d0:60] with SSID[Regression-wpa2-eap-aes-peap] is detecte
2006/06/22 00:12:15 Rogue AP Detected Medium A new Rogue[00:90:4c:7e:00:6e] with SSID[CometTest] is detected on channel [11]
2006/06/22 00:12:16 Rogue AP Detected Medium A new Rogue[00:12:cf:12:cf:45] with SSID[ASP-QA-corp] is detected on channel [36]
2006/06/22 00:12:17 Rogue AP Detected Medium A new Rogue[06:12:cf:12:cf:45] with SSID[ASP-QA-guest] is detected on channel [36]
2006/06/22 00:12:17 Rogue AP Detected Medium A new Rogue[00:12:cf:12:d0:5c] with SSID[Regression-corporate] is detected on chan
2006/06/22 00:12:17 Rogue AP Detected Medium A new Rogue[06:12:cf:12:d0:5c] with SSID[Regression-guest] is detected on channel [
2006/06/22 00:12:17 Rogue AP Detected Medium A new Rogue[0a:12:cf:12:d0:5c] with SSID[Regression-wpa2-eap-aes-peap] is detecte
2006/06/22 00:12:36 Rogue AP Detected Medium A new Rogue[06:12:cf:22:60:cd] with SSID[bizcom-guest] is detected on channel [1]
2006/06/22 00:12:50 Rogue AP Detected Medium A new Rogue[00:12:cf:12:cf:eb] with SSID[ASP-QA-corp] is detected on channel [1]
Search

3 Review the contents of this table. The *Activities* column is especially informative.

4 If a listed alarm condition has been resolved, click the now-active **Clear** link to the right. You also have the option of clicking **Clear All** to resolve all alarms at one time.

Reviewing Recent Network Events

You have two options for reviewing events in your network: [1] open a complete list of all events, or [2] look at specific lists of events in each Monitor tab workspace, such as the WLANs workspace "Events/Activities" table.

1 Open the ZoneDirector **Dashboard** and look at the *Most Recent User Activities* table and *Most Recent System Activities* table for summaries of activity in the network.

2 Go to the **Monitor** tab.

3 Click any of the specific options, such as **WLANs**, **Access Points**, or **Currently Active Clients**.

4 Look for an *All Events* table that specifically focuses on the selected WLAN category.

5 Under the **Monitor** tab, click either **All Alarms** button or **All Events/Activities** button to see a complete list, with all categories represented in chronological order.

Clearing Recent Events/Activities

To review the current events and, if appropriate, clear all resolved events, follow these steps:

1 Go to **Monitor > All Events/Activities**.

2 When the *All Events/Activities* page appears, the *Events/Activities* table lists the unresolved events, the most recent at the top.

3 Review the contents of this table. The *Activities* column is especially informative.

4 You can click **Clear All** at the bottom of the table to resolve and clear all events in the view.

Reviewing Current User Activity

You can monitor current users of the network on a per-client-device basis by doing the following:

1 Go to **Monitor** > **Currently Active Clients**.

2 When the *Currently Active Clients* page appears, review the table for a general survey.

3 Click any client device MAC address link to monitor that client in more detail.

4 To review blocked clients, go to **Configuration** > **Blocked Clients**.

Monitoring Access Point Status

There are several ZoneDirector features you can take advantage of, to monitor the performance and status of your Ruckus wireless APs:

1 Open the **Dashboard** for a snapshot view of the most active APs. Click the MAC address link of any AP record to see more details.

2 Go to **Monitor > Map View** and click a radio frequency to see a heat-map rendering of the current RF coverage.

3 Go to **Monitor > Access Points** and review the usage and coverage of your APs. Click the MAC address link of any listed APs to see more details.

4 Click the **System Info** link to retrieve the support.txt file from an AP.

Detecting Rogue Access Points

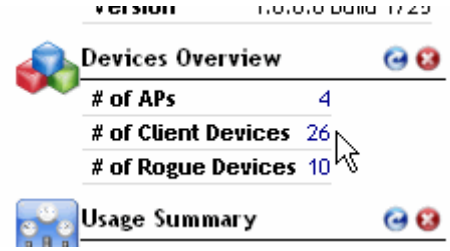
As contrasted with "neighboring" access points (APs) that are parts of a neighboring WLAN, "rogue" (unauthorized) APs pose problems for a wireless network. Usually, a rogue AP appears in the following way: an employee obtains another manufacturer's AP and connects it to the LAN, to gain wireless access to other LAN resources. This would potentially allow even more unauthorized users to access your corporate LAN posing a security risk. Rogue APs also interfere with nearby Ruckus APs, thus degrading overall wireless network coverage.

Your ZoneDirector rogue detection options include identifying the presence of a rogue AP, and locating it on your worksite floorplan prior to its removal. You can also mark rogue APs as "Known" if they are located in a neighboring network—outside your worksite—and pose no threat. To detect a rogue AP, follow these steps:

1 Click the **Dashboard** tab (or go to **Monitor > Rogue Devices**).

2 Look under *Devices Overview* for "# of Rogue Devices".

FIGURE 6-4



3 If there is at least once rogue device detected, click the number for more details.

4 When the **Monitor** > **Rogue Devices** page appears, two tables are listed:

- The *Currently Active Rogue Devices* table
- The *Known/Recognized Rogue Devices* table.

5 Review the *Currently Active Rogue Devices* table. The types of Rogue APs recognized by Zone Director are (an alarm is generated if ZoneDirector detects one of these rogue APs):

- AP: An access point unknown to ZoneDirector.
- AP (SSID-spoof): A rogue AP that uses the same SSID as ZoneDirector's AP, also known as *Evil-twin AP*.
- AP (MAC-spoof): A rogue AP that has the same BSSID (MAC) of one of the virtual APs managed by ZoneDirector.

The *Encryption* column indicates if a rogue device is encrypted or is open.

6 If a listed AP is part of another, nearby neighbor network, click **Mark as Known**. This identifies the AP as posing no threat, while copying the record to the *Known/Recognized Rogue Devices* table.

7 To locate rogue APs that do pose a threat to your internal WLAN, click the **MAC Address** of a device to open the Map View.

8 If your worksite floorplan is imported into the Map View window and your APs are positioned on the map, rogue APs can be generally identified with relative accuracy.

9 Open the Map View, and look for rogue APs that appear as shown here:

This provides a clue as to their location.

10 You can now find the rogue APs and disconnect them. Or, if a rogue AP is actually a component in a neighboring network, you can mark it as "known".

TIP	If your office/worksite is on a single floor in a multistory building, your upper- and lower-floor neighbors' wireless access points may show up on the Map View, but seemingly in your site. As Ruckus cannot locate them in vertical space, you may need to do a bit more research to determine where the AP is located and if it should be marked as "Known".

Detecting Rogue DHCP Servers

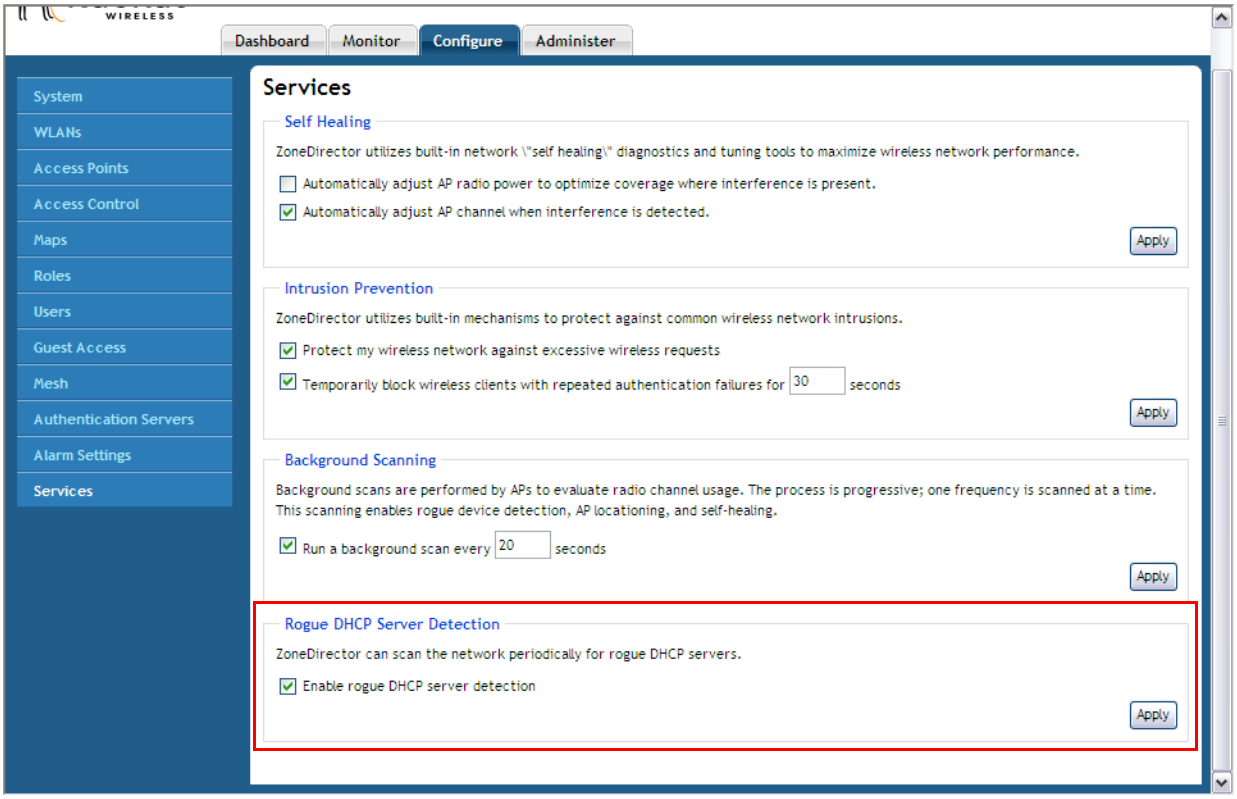
A rogue DHCP server is a DHCP server that is not under the control of network administrators and is therefore unauthorized. When a rogue DHCP server is introduced to the network, it could start assigning invalid IP addresses, disrupting network connections or preventing client devices from accessing network services. It could also be used by hackers to compromise network security. Typically, rogue DHCP servers are network devices (such as routers) with built-in DHCP server capability that has been enabled (often, unknowingly) by users.

ZoneDirector has a rogue DHCP server detection feature that can help you prevent connectivity and security issues caused that rogue DHCP servers may cause. When this feature is enabled, ZoneDirector scans the network every five seconds for unauthorized DHCP servers and generates an event every time it detects a rogue DHCP server.

The conditions for detecting rogue DHCP servers depend on whether ZoneDirector's own DHCP server is enabled:

- If the built-in DHCP server is enabled, ZoneDirector will generate an event when it detects any other DHCP server on the network.
- If the built-in DHCP server is disabled, ZoneDirector will generate events when it detects two or more DHCP servers on the network. You will need to find these DHCP servers on the network, determine which ones are rogue, and then disconnect them or shut down the DHCP service on them.

FIGURE 6-5: The Rogue DHCP Server Detection option


Dashboard
Monitor
Configure
Administer
System
WLANs
Access Points
Access Control
Maps
Roles
Users
Guest Access
Mesh
Authentication Servers
Alarm Settings
Services
Services
Self Healing
ZoneDirector utilizes built-in network \"self healing\" diagnostics and tuning tools to maximize wireless network performance.
Automatically adjust AP radio power to optimize coverage where interference is present.
Automatically adjust AP channel when interference is detected.
Apply
Intrusion Prevention
ZoneDirector utilizes built-in mechanisms to protect against common wireless network intrusions.
Protect my wireless network against excessive wireless requests
Temporarily block wireless clients with repeated authentication failures for 30 seconds
Apply
Background Scanning
Background scans are performed by APs to evaluate radio channel usage. The process is progressive; one frequency is scanned at a time. This scanning enables rogue device detection, AP locationing, and self-healing.
Run a background scan every 20 seconds
Apply
Rogue DHCP Server Detection
ZoneDirector can scan the network periodically for rogue DHCP servers.
Enable rogue DHCP server detection
Apply

To enable rogue DHCP server detection on ZoneDirector:

1 On the **Configure** tab, click **Services** on the menu.

2 Under **Rogue DHCP Server Detection**, select the **Enable rogue DHCP server detector** check box.

3 Click **Apply**.

You have completed enabling rogue DHCP server detection. Ruckus Wireless recommends checking the Monitor > All Events/Activities page periodically to determine if ZoneDirector has detected any rogue DHCP server. If ZoneDirector detected any rogue DHCP server, you will see the following event on the All Events/Activities page:

```
Rogue DHCP server on [IP_address] has been detected
```

Evaluating and Optimizing Network Coverage

If there are gaps or dead spots in your worksite WLAN coverage, you can use ZoneDirector to assess network RF coverage and then reposition APs to enhance coverage. Remember that a Ruckus AP can cover an area with a radius of 30 to 50 feet using average broadcasting power settings on any frequency. Local structural obstructions may limit coverage.

1 Go to **Monitor** > **Map View**.

2 If Map View displays a floorplan with active device symbols, you can assess the performance of individual APs, in terms of coverage. (See *"Importing a Map View Floorplan Image"* on page 90 for information on setting up the Map View.)

3 For the *Coverage* option, click **Yes**.

4 When the "heat map" appears, look for a **Signal%** scale in the upper right corner of the map.

5 Note the color range, especially colors that indicate low coverage.

6 Look at the floorplan and evaluate the current coverage.

Moving the APs into More Efficient Positions

You can now move the APs into more efficient positions.

1 To do so, click and drag individual AP markers on the Map View floorplan until your RF coverage coloration is optimized. (You may need to acquire additional APs to fill in large coverage gaps.)

2 To turn off the heat map and restore the floorplan to view, click **No** (in the *Coverage* options).

3 Note down the new physical locations of relocated AP markers.

4 After physically relocating the actual APs in accordance with Map View repositioning, disconnect and reconnect each AP to a power source.

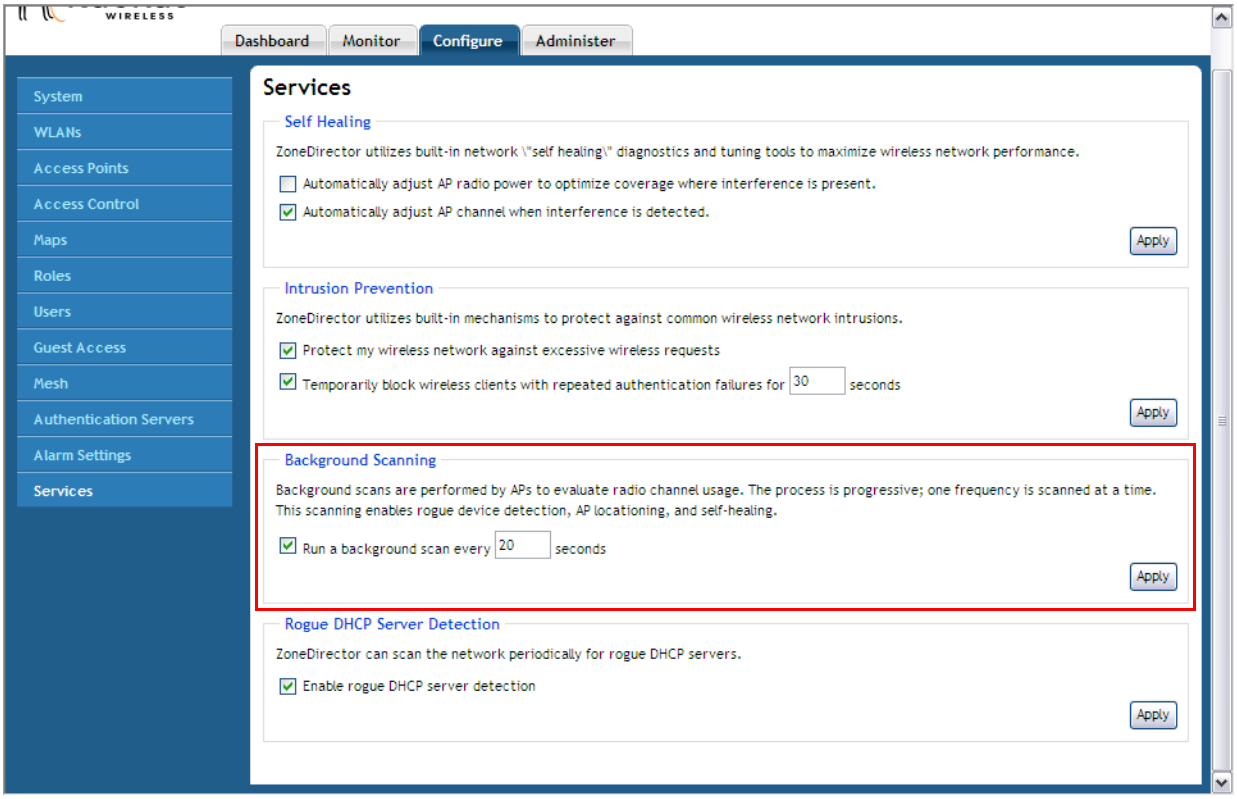
5 When ZoneDirector has recalibrated the Map View after each AP restart, you can assess your changes, and make further adjustments as needed.

Customizing Background Radio Frequency Scans

As a key element of your network monitoring, the Ruckus ZoneDirector regularly samples the activity in all Access Points to assess radio frequency (RF) usage. The scans sample one channel at a time in each AP, and do not interfere with network use. This information is then applied in Map View and other ZoneDirector monitoring features.

1 Go to **Configure** > **Services**.

FIGURE 6-6: The Background Scanning options


Dashboard
Monitor
Configure
Administer
System
WLANs
Access Points
Access Control
Maps
Roles
Users
Guest Access
Mesh
Authentication Servers
Alarm Settings
Services
Services
Self Healing
ZoneDirector utilizes built-in network \"self healing\" diagnostics and tuning tools to maximize wireless network performance.
Automatically adjust AP radio power to optimize coverage where interference is present.
Automatically adjust AP channel when interference is detected.
Apply
Intrusion Prevention
ZoneDirector utilizes built-in mechanisms to protect against common wireless network intrusions.
Protect my wireless network against excessive wireless requests
Temporarily block wireless clients with repeated authentication failures for 30 seconds
Apply
Background Scanning
Background scans are performed by APs to evaluate radio channel usage. The process is progressive; one frequency is scanned at a time. This scanning enables rogue device detection, AP locationing, and self-healing.
Run a background scan every 20 seconds
Apply
Rogue DHCP Server Detection
ZoneDirector can scan the network periodically for rogue DHCP servers.
Enable rogue DHCP server detection
Apply

2 Select the **Run background scan every** check box, and type the interval (in seconds, default is 20) that you want to set between each scan.

You can disable this feature by clearing the check box, which results in a minor increase in AP performance, but removes the detection of rogue APs from ZoneDirector monitoring.

You can also decrease the scan frequency, as less frequent scanning improves overall AP performance.

3 Click **Apply** to save your settings.

CHAPTER 7

Setting Administrator Preferences

Chapter Contents

- *"Using an External Server for Administrator Authentication"* 103
- *"Changing the ZoneDirector Administrator User Name and Password"* 108
- *"Changing the Web Interface Display Language"* 109
- *"Upgrading the License"* 109

Using an External Server for Administrator Authentication

ZoneDirector software version 7.0 provides support for additional administrator accounts that can be authenticated using an external authentication server such as RADIUS or Active Directory. Two types of administrative privileges can be assigned to these administrator accounts:

- Full Privileges – Allow all types of configuration and management tasks
- Limited Privileges – Allow monitoring operations only

This section provides basic instructions for setting up ZoneDirector to authenticate additional administrator accounts with an external authentication server.

Step 1: Set Up Groups/Attributes on the Authentication Server

The tasks that you need to perform to set up groups/attributes on the authentication server depend on whether you are using RADIUS or Active Directory.

NOTE	For specific instructions on how to complete these tasks, refer to the documentation that is supplied with your authentication server.

If You Are Using RADIUS for Authentication

1 Set up one of the following vendor-specific attributes. Remember the attributes that you set; you will enter this information when you create administrator roles in ZoneDirector (*see Step 3*).

- Ruckus Wireless private attribute
  - Vendor ID: 25053
  - Vendor Type/Attribute Number: 1 (Ruckus-User-Groups)
  - Value Format: group_attr1,group_attr2,group_attr3,...
- Cisco private attribute (if your network is using a Cisco access control server)
  - Vendor ID: 9
  - Vendor Type / Attribute Number: 1 (Cisco-AVPair)
  - Value Format: shell:roles="group_attr1 group_attr2 group_attr3 ..."

2 Set up a shared secret on the RADIUS server. You will enter the same shared secret on the ZoneDirector Web interface to enable ZoneDirector to communicate with the RADIUS server for authentication.

If You Are Using Active Directory for Authentication

Set up two groups – one for administrators with *Full Privileges* and another for administrators with *Limited Privileges*. Populate these groups with users to whom you want to grant administrator access. One way to do this is to edit each user's **Member of** profile and add the group to which you want the user to belong.

Remember the group names that you set; you will enter this information when you create administrator roles in ZoneDirector (*see Step 3*).

Step 2: Set Up ZoneDirector to Use an Authentication Server

1 Log in to the ZoneDirector Web interface.

2 Click the **Configure** tab, and then click **Authentication Servers** on the menu.

3 Under **Authentication Servers**, click the **Create New** link. The Create New form appears.

4 In **Name**, type a name that you want to use to identify this authentication server. The actual authentication server name that will appear after you finish this procedure will include this name and the authentication server type. For example, if you type HEDY in **Name** and you click **RADIUS** in **Type** (below), the actual authentication server name that you will see is HEDY RADIUS.

5 In **Type**, click the type of authentication server that you want to use. Options include **Active Directory** and **RADIUS**.

6 In **IP Address**, type the IP address of the authentication server.

7 In **Port**, type the authentication port number.

- If you are using Active Directory, the default port number is 389.
- If you are using RADIUS, the default port number is 1812.

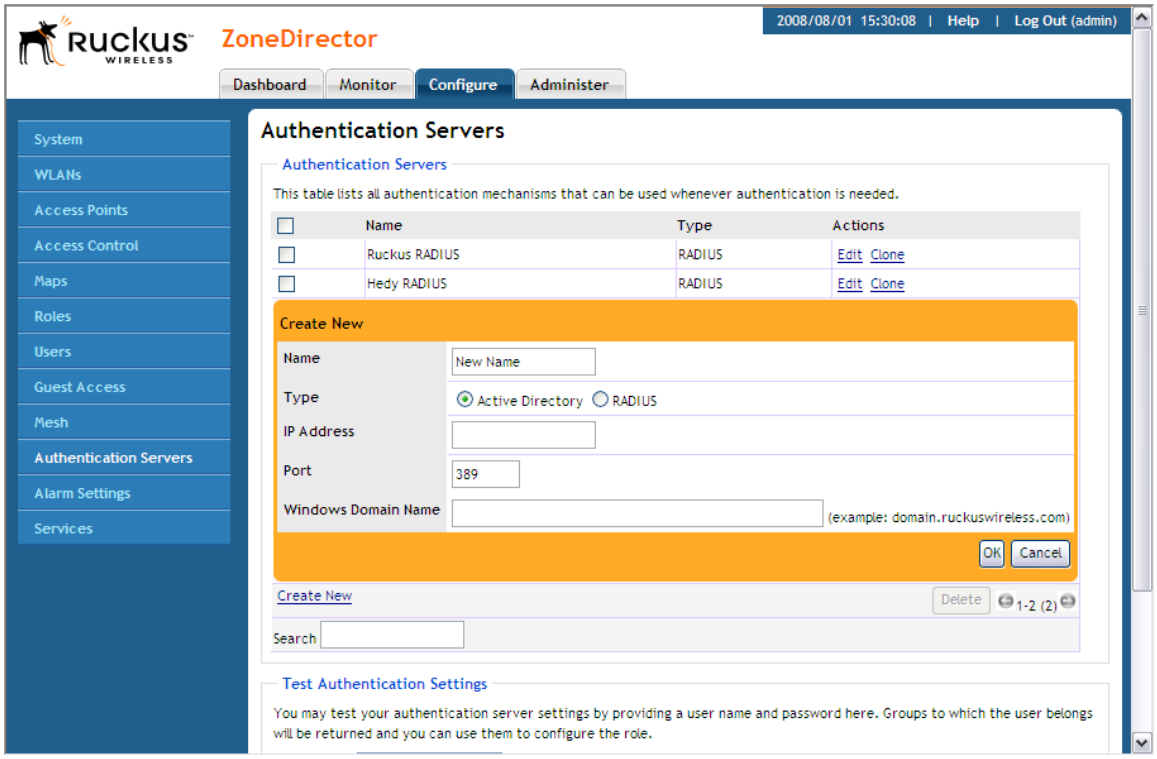
8 Configure server-specific settings:

- If you clicked **Active Directory**, type the Active Directory domain name in **Windows Domain Name**.
- If you clicked **RADIUS**, type the shared secret on the RADIUS that you set up in Step 1, and then retype it to confirm.

9 Click **OK**.

The Authentication Servers page refreshes and the server that you have created appears in the table. You have completed setting up ZoneDirector to use an external authentication server.

FIGURE 7-1: The Authentication Servers page



Step 3: Create an Administrator Role

1 Click the **Configure** tab, and then click Roles on the menu. The Roles and Policies page appears.

2 Under **Roles**, click the **Create New** link. The Create New form appears.

3 In **Name**, type a unique name for this administrator role that you are creating. For example, if you are creating this role for administrators with limited privileges, you can type admin-limited.

4 In **Group Attributes**, type the group name or attribute that you configured on the authentication server in Step 1. For authentication to work, the group name or attribute that you type in this box must *exactly match* the attribute on the authentication server.

5 In **Administration**, select the **Allow ZoneDirector Administration** check box.

IMPORTANT If you do not select the Allow ZoneDirector Administration check box, administrators that are assigned this role will be unable to log in to ZoneDirector even if all other settings are configured correctly.

6 When the privilege options appear under the check box, click the type of privileges that you want to grant this role. Options include:

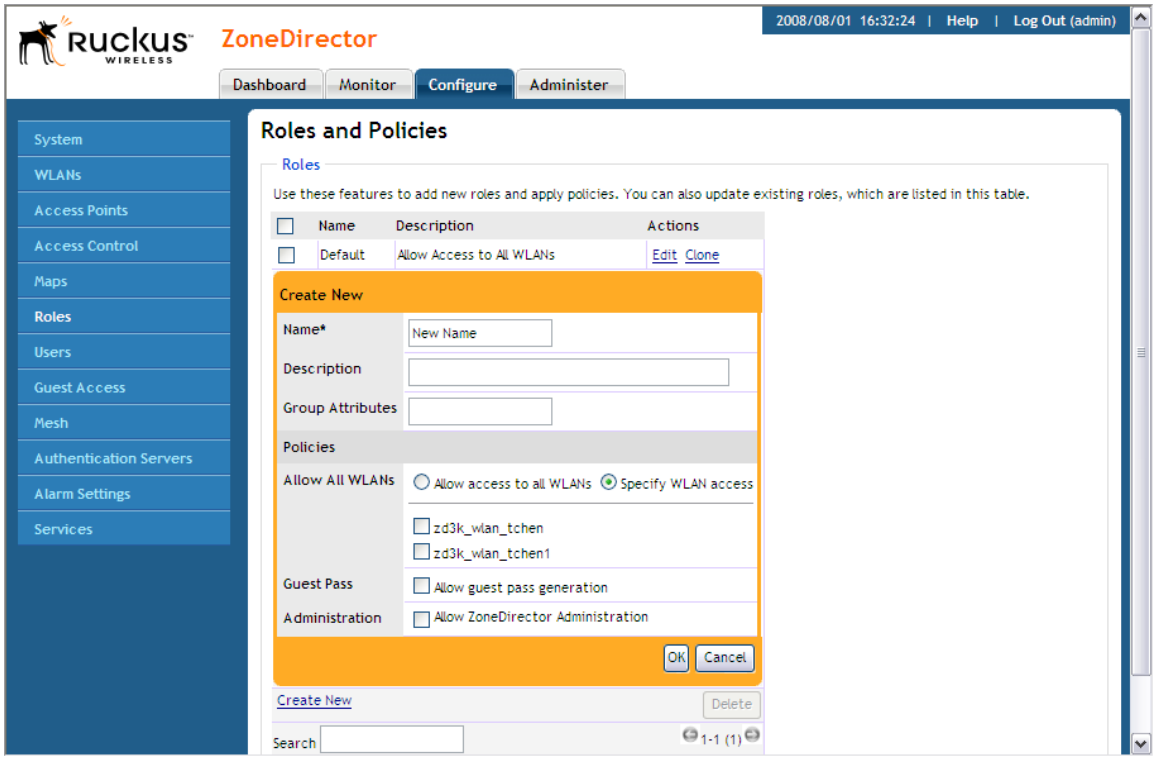
- **Full privileges** (Perform all configuration and management tasks)
- **Limited privileges** (Monitoring and viewing operation status only)

7 Configure other settings (Description, Policies, and Guest Pass) on the page as required.

8 Click **OK** to save your changes.

You have completed creating an administrator role.

FIGURE 7-2: The Roles and Policies page



Step 4: Test Your Authentication Settings

Perform this task to ensure that ZoneDirector can connect to the authentication server and retrieve the groups/attributes that you have configured for each user account.

1 Click the **Configure** tab, and then click **Authentication Servers** on the menu.

2 Under the **Test Authentication Settings** section, select the authentication server that you want to use from the **Test Against** drop-down menu.

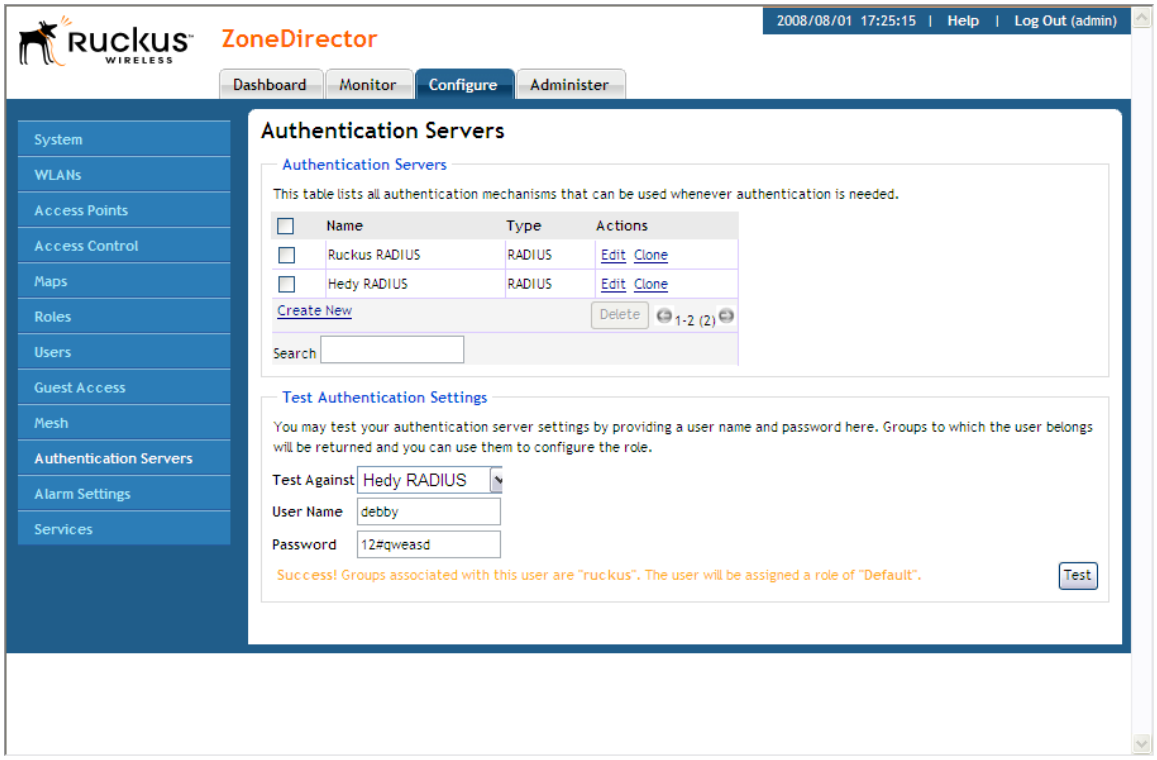
3 In **User Name** and **Password**, enter a RADIUS or Active Directory user name and password.

4 Click **Apply**.

If ZoneDirector was able to connect to the authentication server and retrieve the configured groups/attributes, the information appears at the bottom of the page. The following is an example of the message that will appear when ZoneDirector authenticates successfully with the server:

```
Success! Groups associated with this user are “{group_name}”. This
user will be assigned a role of {role}.
```

FIGURE 7-3: The Test Authentication Settings section on the Authentication Servers page



Step 5: Specify the Authentication Server to Use

1. Click the **Administer** tab, and then click **Preferences** on the menu.
2. Under **Administrator Name/Password**, click **Authenticate with Auth Server.**
3. On the drop-down menu, select the name of the authentication server with which administrators will authenticate. The authentication server names that appear on the drop-down menu are the same as the server names that appear on the **Configure** > **Authentication Servers** page.
4. Verify that the **Fallback to admin name/password if failed** check box is selected. Keeping this check box selected ensures that administrators will still be able to log in to the ZoneDirector Web interface even when the authentication server is unavailable.
5. Change the administrator name and password, if preferred.
6. Click **Apply**.

Congratulations! You have completed setting up ZoneDirector to use external servers for administrator authentication. Whenever a user with administrator privileges logs into the ZoneDirector Web interface, an event will be recorded. The following is an example of the event details that you will see:

```
Admin [user_name] login (authenticated by {Authentication Server}
with {Role}).
```

Changing the ZoneDirector Administrator User Name and Password

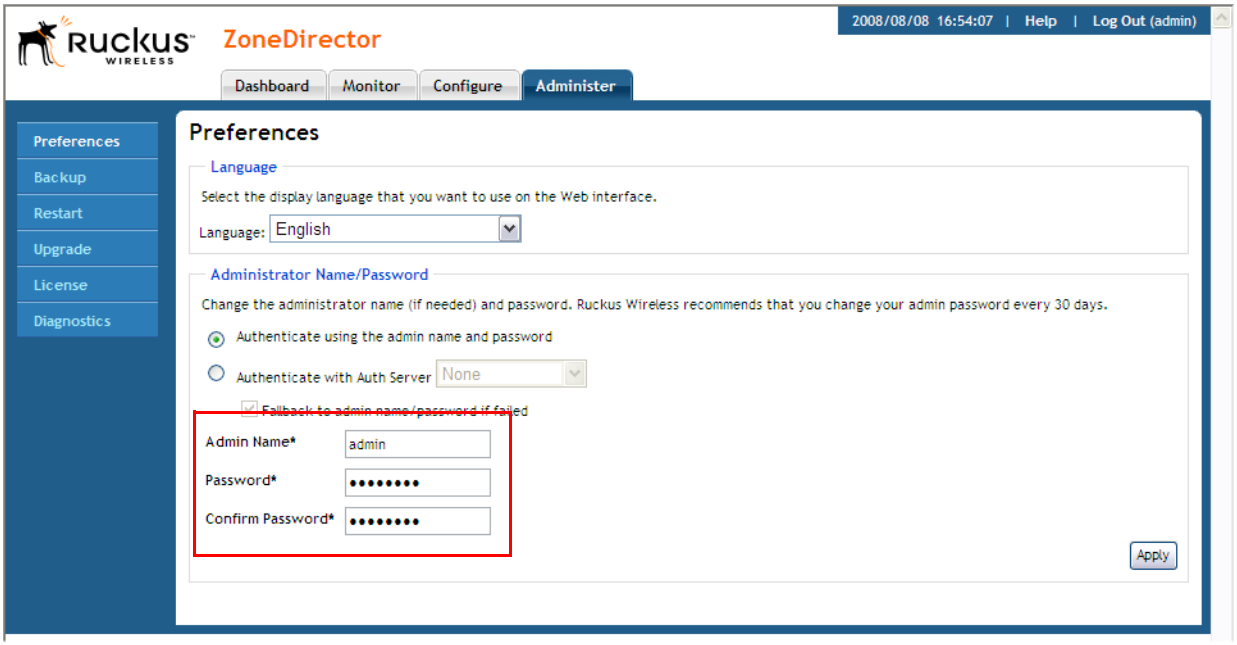
You should change your ZoneDirector administrator login password on a monthly basis, but the administrator user name should be changed only if necessary.

NOTE	If authentication with an external server is enabled and the **Fallback to admin name/password if failed** check box is disabled, you will be unable to edit the user name and password. To edit the user name and password: 1. Select the **Fallback to admin name/password if failed** check box to enable the user name and password boxes. 2. Change the user name and password. 3. Clear the **Fallback to admin name/password if failed** check box. 4. Click **Apply** to save your changes.

To edit or replace the current name or password:

1 Go to **Administer** > **Preferences**.

FIGURE 7-4: The Preferences page



2 When the *Preferences* page appears, you have the following options under *Administrator Name/Password*:

Admin Name	Delete the text in this field and type the new administrator account name (used solely to log into ZoneDirector via the Web interface.)
Password/Confirm Password	Delete the text in both fields and type the same text for a new password.

3 Click **Apply** to save your settings. The changes go into effect immediately.

Changing the Web Interface Display Language

Depending on your preferences, you can change the language in which the Web interface is displayed in your Web browser. The default is "English".

This change only affects how the Web interface appears, and does not modify either OS/system or browser settings (which are managed through other processes).

1 Go to **Administer** > **Preferences**.

2 When the *Preferences* page appears, open the **Language** menu and choose the preferred language. See "FIGURE 7-4" on page 108.

ALERT!	This only affects how the Web interface appears, and does not modify either system (OS) or browser settings.

3 Click **Apply** to save your settings. The changes go into effect immediately.

Upgrading the License

Depending on the number of Ruckus Wireless APs you need to manage with your ZoneDirector, you may need to upgrade your license. Once you load the license via the Web interface, it takes effect immediately.

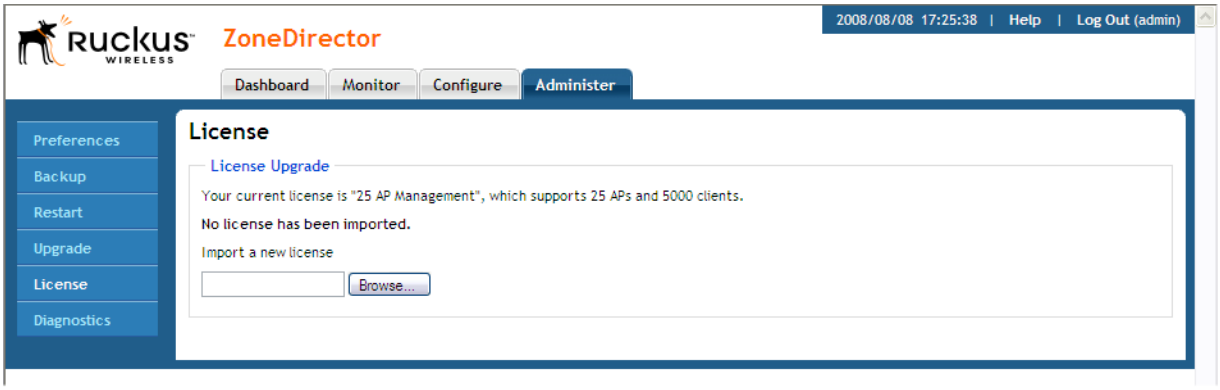
Current license information (description, PO number, status, etc) is displayed on the Web interface.

NOTES	• The system does not reboot or reset after a license is imported. • This version of ZoneDirector supports tunnel mode and Opportunistic PMK Caching (OPC). If you want to use these features, you will need to import an additional license file called Mobility License. To purchase a Mobility License, contact Ruckus Wireless or an authorized reseller.

To import a new license, do the following:

1 Go to **Administer > License**.

FIGURE 7-5: The License page



2 Click **Browse** to find your license.

3 Once you find your license and closed the *Browse* window, ZoneDirector immediately attempts to validate and install the license.

CHAPTER 8

Troubleshooting

Chapter Contents

- *"Troubleshooting Failed User Logins"* 112
- *"Fixing User Connections"* 113
- *"Measuring the Wireless Network Throughput"* 114
- *"Diagnosing Poor Network Performance"* 119
- *"Starting a Radio Frequency Scan"* 120
- *"Reviewing Self Healing and Intrusion Prevention Options"* 121
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Troubleshooting Failed User Logins

SUMMARY: This "troubleshooting" topic addresses the problems that network users might have with configuring their client devices and logging into your Ruckus WLAN.

At the end of the setup wizard, your Ruckus ZoneDirector automatically activates a default internal WLAN for authorized users. A key benefit of the internal WLAN is the "zero IT" configuration, which extends to new users, to make their device configuration and initial login as easy as it can be. "Zero IT" client device configuration requires the client be running Windows XP SP 2/Vista, and using a wireless network adapter that implements WPA.

If you and your WLAN users run into initial connection failures when using the "zero IT" configuration and login, almost all of the problems have two key causes:

- Your users' client devices are running another OS, or running a version of Windows pre-XP/SP2. (This includes XP/SP1.)
- Your users' client devices are using wireless network adapters without a WPA implementation.

The following list of options may be applicable based on your client system's qualifications:

Option 1 — If Windows XP SP2/Vista is on the client machine, check the wireless network adapter to verify the implementation of WPA.

Option 2 — Upgrade to Windows XP SP2/Vista, and if needed, acquire a wireless network adapter with WPA support. Once these changes are made, your users can attempt a "zero IT" login.

Option 3 — If an older version of Windows is in use, or if another OS is being used, the user must manually enter the Ruckus WPA passphrase in their network configuration.

Option 4 — Assumes that the client OS cannot be upgraded and the wireless network adapter is limited to WEP. This requires two phases:

Ruckus Administration— [1] You, the network manager, create a supplemental WLAN for the non-standard client connections, then [2] create a Role that refers to this WLAN, and [3] assign that role to the affected user account.

User Configuration— Enter the needed WEP key in the network configuration.

In most solutions, you will need to open a Windows control panel and enter a WPA passphrase which you provide, or a WEP key (if you switch internal WLAN to WEP, which means you must provide the user with a copy of the key.) Once the passphrase or key is stored in Windows on their client, they can log into the WLAN.

Fixing User Connections

If any of your users report problematic connections to the WLAN, here is one debugging technique that may prove helpful. Basically, you will be deleting that user's client from the Active Clients table in the Ruckus ZoneDirector, and when their client connection automatically renews itself, any previous problems will hopefully be bypassed.

To debug an active user connection, follow these steps:

1 Go to **Monitor** > **Currently Active Clients**.

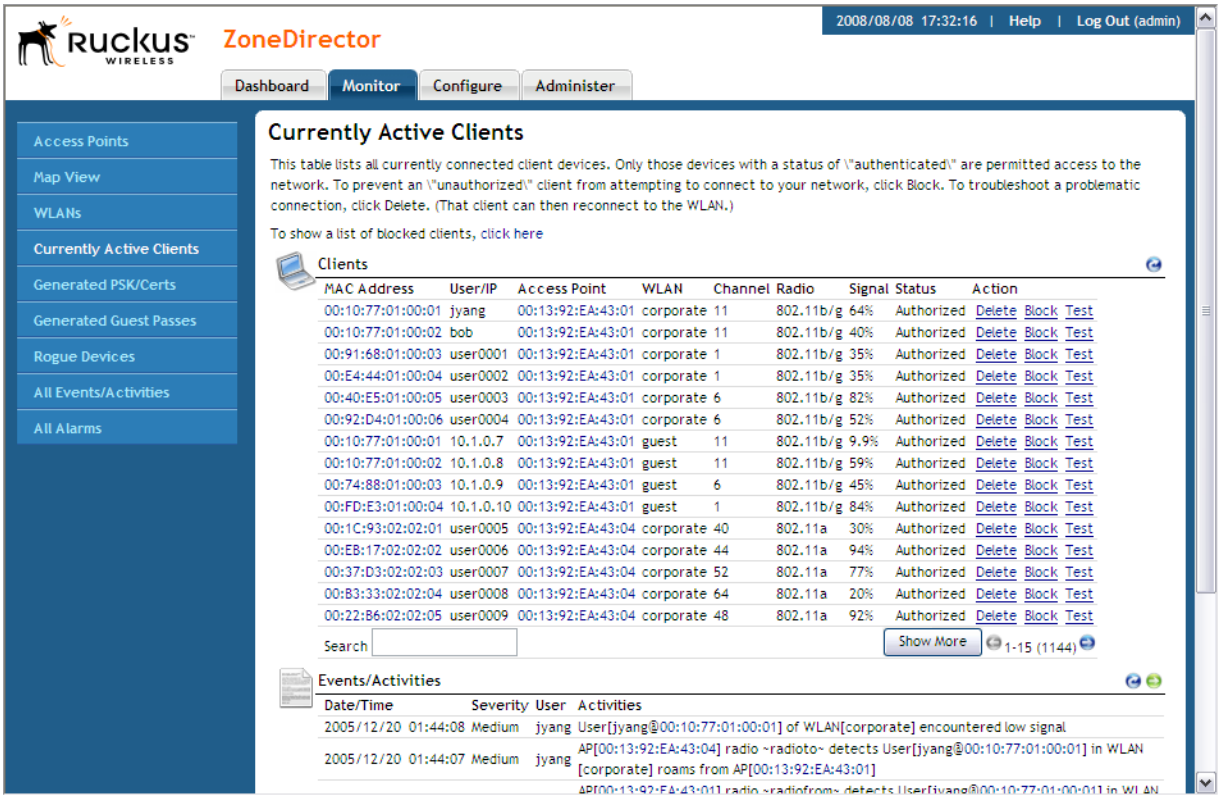
2 When the *Currently Active Clients* page appears, locate the buggy client connection in the *Clients* table.

3 Click **Delete**.

That client will be automatically logged out of ZoneDirector.

After a minute or two, when the client has automatically re-logged into the WLAN, the Client table will re-display the client and the user will have fewer or no problems.

FIGURE 8-1: The Currently Active Clients page


Ruckus WIRELESS
ZoneDirector
2008/08/08 17:32:16 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
Access Points
Map View
WLANs
Currently Active Clients
Generated PSK/Certs
Generated Guest Passes
Rogue Devices
All Events/Activities
All Alarms
Currently Active Clients
This table lists all currently connected client devices. Only those devices with a status of \"authenticated\" are permitted access to the network. To prevent an \"unauthorized\" client from attempting to connect to your network, click Block. To troubleshoot a problematic connection, click Delete. (That client can then reconnect to the WLAN.)
To show a list of blocked clients, click here
Clients
MAC Address User/IP Access Point WLAN Channel Radio Signal Status Action
00:10:77:01:00:01 jyang 00:13:92:EA:43:01 corporate 11 802.11b/g 64% Authorized Delete Block Test
00:10:77:01:00:02 bob 00:13:92:EA:43:01 corporate 11 802.11b/g 40% Authorized Delete Block Test
00:91:68:01:00:03 user0001 00:13:92:EA:43:01 corporate 1 802.11b/g 35% Authorized Delete Block Test
00:E4:44:01:00:04 user0002 00:13:92:EA:43:01 corporate 1 802.11b/g 35% Authorized Delete Block Test
00:40:E5:01:00:05 user0003 00:13:92:EA:43:01 corporate 6 802.11b/g 82% Authorized Delete Block Test
00:92:D4:01:00:06 user0004 00:13:92:EA:43:01 corporate 6 802.11b/g 52% Authorized Delete Block Test
00:10:77:01:00:01 10.1.0.7 00:13:92:EA:43:01 guest 11 802.11b/g 9.9% Authorized Delete Block Test
00:10:77:01:00:02 10.1.0.8 00:13:92:EA:43:01 guest 11 802.11b/g 59% Authorized Delete Block Test
00:74:88:01:00:03 10.1.0.9 00:13:92:EA:43:01 guest 6 802.11b/g 45% Authorized Delete Block Test
00:FD:E3:01:00:04 10.1.0.10 00:13:92:EA:43:01 guest 1 802.11b/g 84% Authorized Delete Block Test
00:1C:93:02:02:01 user0005 00:13:92:EA:43:04 corporate 40 802.11a 30% Authorized Delete Block Test
00:EB:17:02:02:02 user0006 00:13:92:EA:43:04 corporate 44 802.11a 94% Authorized Delete Block Test
00:37:D3:02:02:03 user0007 00:13:92:EA:43:04 corporate 52 802.11a 77% Authorized Delete Block Test
00:B3:33:02:02:04 user0008 00:13:92:EA:43:04 corporate 64 802.11a 20% Authorized Delete Block Test
00:22:B6:02:02:05 user0009 00:13:92:EA:43:04 corporate 48 802.11a 92% Authorized Delete Block Test
Search
Show More
1-15 (1144)
Events/Activities
Date/Time Severity User Activities
2005/12/20 01:44:08 Medium jyang User[jyang@00:10:77:01:00:01] of WLAN[corporate] encountered low signal
2005/12/20 01:44:07 Medium jyang AP[00:13:92:EA:43:04] radio ~radioto~ detects User[jyang@00:10:77:01:00:01] in WLAN [corporate] roams from AP[00:13:92:EA:43:01]

If WLAN Connection Problems Persist

If the previous technique fails to resolve the user's client mis-connections, you may need to guide them through a full re-setting of their WLAN configuration. This requires your deleting the user record, then creating a new user record, at which time the user must repeat the "new user connection" process, with the two-part login and the downloading and installing of a new WLAN configuration.

1 Have the user log out of the WLAN until they receive notification from you.

2 Go to **Configure** > **Users**.

3 When the *User Authentication* features appear, locate and delete this user record from the *Internal Users Database* table.

4 Add a new user account for this user, and send notification to that user, with instructions on how to re-configure their client and log into the WLAN again.

At the end of this process, the user should be reconnected. If problems persist, they may originate in Windows or in the wireless network adapter.

Measuring the Wireless Network Throughput

A wireless performance tool is included in ZoneDirector that you can use to measure the downlink throughput between a wireless client and the AP with which it is associated. When performing a site survey, you can use this tool to help find the optimum location for APs on the network with respect to user locations.

To measure the downlink throughput from a client:

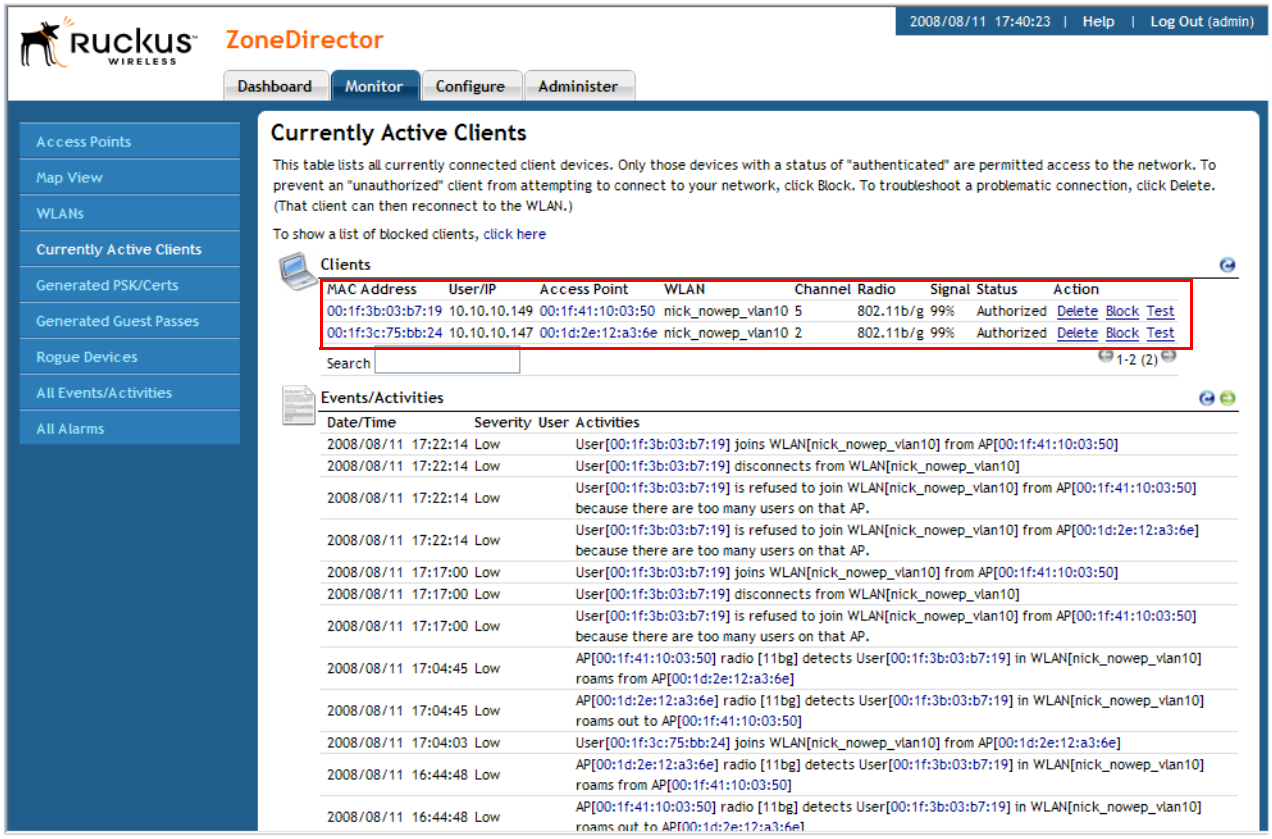
1 Find out the MAC address of the wireless client that you want to use for this test procedure. On Windows, you can view this information by running `ipconfig /all` at the command prompt.

2 Associate the wireless client with the AP that you want to test. Make sure that the client you are using is connected to the network only via the WLAN. If the client is also connected to the wired network, unplug the network cable.

3 On the same wireless client, log in to the ZoneDirector Web interface.

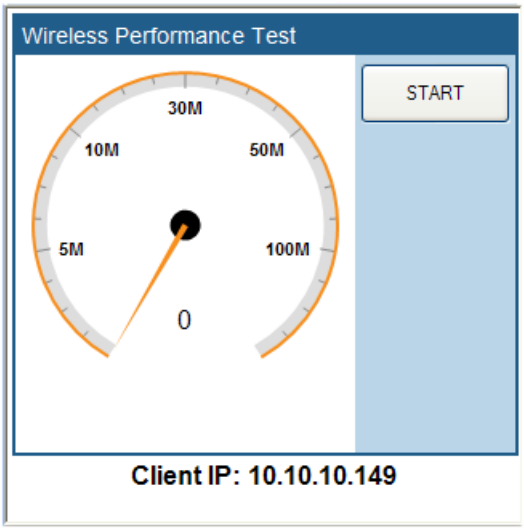
4 Go to **Monitor** > **Currently Active Clients**.

FIGURE 8-2: Go to Monitor > Currently Active Clients


Ruckus WIRELESS
ZoneDirector
2008/08/11 17:40:23 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
Access Points
Map View
WLANs
Currently Active Clients
Generated PSK/Certs
Generated Guest Passes
Rogue Devices
All Events/Activities
All Alarms
Currently Active Clients
This table lists all currently connected client devices. Only those devices with a status of "authenticated" are permitted access to the network. To prevent an "unauthorized" client from attempting to connect to your network, click Block. To troubleshoot a problematic connection, click Delete. (That client can then reconnect to the WLAN.)
To show a list of blocked clients, click here
Clients
MAC Address User/IP Access Point WLAN Channel Radio Signal Status Action
00:1f:3b:03:b7:19 10.10.10.149 00:1f:41:10:03:50 nick_nowep_vlan10 5 802.11b/g 99% Authorized Delete Block Test
00:1f:3c:75:bb:24 10.10.10.147 00:1d:2e:12:a3:6e nick_nowep_vlan10 2 802.11b/g 99% Authorized Delete Block Test
Search
1-2 (2)
Events/Activities
Date/Time Severity User Activities
2008/08/11 17:22:14 Low User[00:1f:3b:03:b7:19] joins WLAN[nick_nowep_vlan10] from AP[00:1f:41:10:03:50]
2008/08/11 17:22:14 Low User[00:1f:3b:03:b7:19] disconnects from WLAN[nick_nowep_vlan10]
2008/08/11 17:22:14 Low User[00:1f:3b:03:b7:19] is refused to join WLAN[nick_nowep_vlan10] from AP[00:1f:41:10:03:50] because there are too many users on that AP.
2008/08/11 17:22:14 Low User[00:1f:3b:03:b7:19] is refused to join WLAN[nick_nowep_vlan10] from AP[00:1d:2e:12:a3:6e] because there are too many users on that AP.
2008/08/11 17:17:00 Low User[00:1f:3b:03:b7:19] joins WLAN[nick_nowep_vlan10] from AP[00:1f:41:10:03:50]
2008/08/11 17:17:00 Low User[00:1f:3b:03:b7:19] disconnects from WLAN[nick_nowep_vlan10]
2008/08/11 17:17:00 Low User[00:1f:3b:03:b7:19] is refused to join WLAN[nick_nowep_vlan10] from AP[00:1f:41:10:03:50] because there are too many users on that AP.
2008/08/11 17:04:45 Low AP[00:1f:41:10:03:50] radio [11bg] detects User[00:1f:3b:03:b7:19] in WLAN[nick_nowep_vlan10] roams from AP[00:1d:2e:12:a3:6e]
2008/08/11 17:04:45 Low AP[00:1d:2e:12:a3:6e] radio [11bg] detects User[00:1f:3b:03:b7:19] in WLAN[nick_nowep_vlan10] roams out to AP[00:1f:41:10:03:50]
2008/08/11 17:04:03 Low User[00:1f:3c:75:bb:24] joins WLAN[nick_nowep_vlan10] from AP[00:1d:2e:12:a3:6e]
2008/08/11 16:44:48 Low AP[00:1d:2e:12:a3:6e] radio [11bg] detects User[00:1f:3b:03:b7:19] in WLAN[nick_nowep_vlan10] roams from AP[00:1f:41:10:03:50]
2008/08/11 16:44:48 Low AP[00:1f:41:10:03:50] radio [11bg] detects User[00:1f:3b:03:b7:19] in WLAN[nick_nowep_vlan10] roams out to AP[00:1d:2e:12:a3:6e]

5 On the **Currently Active Clients** page, look for the MAC address of the wireless client that you are using, and then click the **Test** link that is on the same row. The Wireless Performance Test interface loads, showing the IP address of the client that you are using.

FIGURE 8-3: The Wireless Performance Test interface



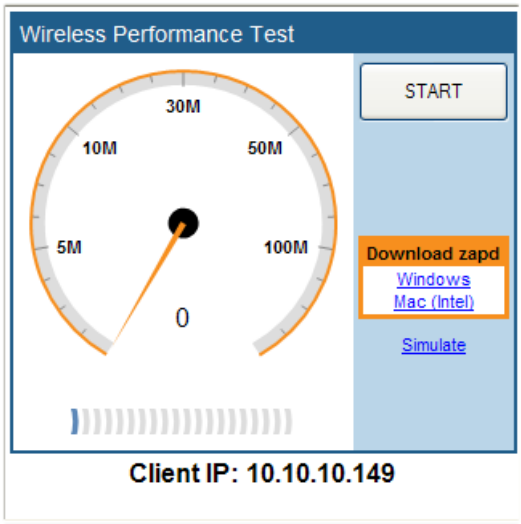
6 Click the **Start** button. The following message appears:

`You don't have zapd installed. Please download and run the zapd.`

Zapd is a Ruckus Wireless proprietary application that simulates traffic between a client and the AP.

7 Click **OK**. Windows and Mac (Intel) download links for zapd appear on the Wireless Performance Test interface.

FIGURE 8-4: Click the download link for your client's operating system



8 Click the zapd version that is appropriate for the client's operating system, download the zapd file, and then save it to the client's local hard drive.

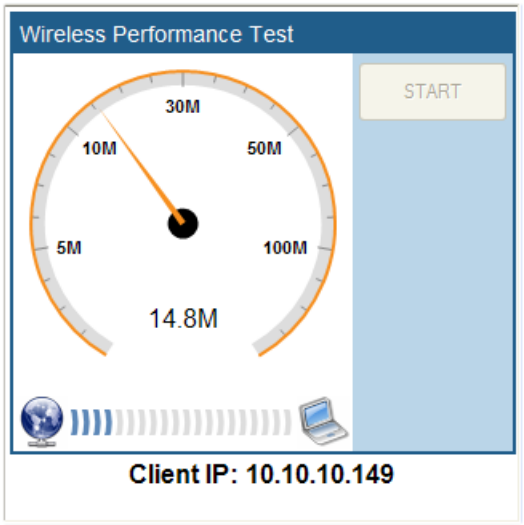
9 After downloading the zapd file, locate the file, and then double-click the file to start the application. A command prompt window appears and shows the following message:

`Entering infinite loop. Enjoy the ride.`

This indicates that zapd was successfully started. Keep the command prompt window open.

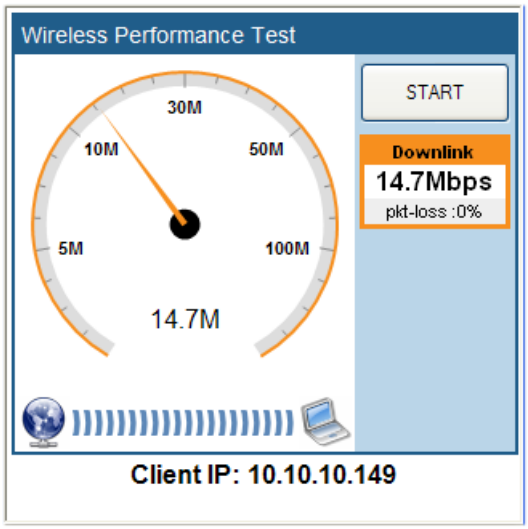
10 On the Wireless Performance Test interface, click the **Start button** again. A progress bar appears below the speedometer as the tool generates traffic to measure the downlink throughput from the AP to the client. The test typically runs from 10 to 30 seconds.

FIGURE 8-5: A progress bar appears as the tool measures the wireless throughput



When the test is complete, the results appear below the **Start** button. Information that is shown includes the downlink throughput and the packet loss percentage during the test.

FIGURE 8-6: When the test is complete, the tool shows the downlink throughput and packet loss percentage



Allowing Users to Measure Their Own Wireless Throughput

ZoneDirector provides another version of the Wireless Performance Test application that does not require authentication. This version can be accessed at `http://{zonedirector-ip-address}/perf`.

If you want wireless users to be able to measure their own wireless throughput, you can provide this link to them, along with the instructions below. Before sending out these instructions, remember to replace the `{zonedirector-ip-address}` variable with the actual ZoneDirector IP address.

How to Measure the Speed of Your Wireless Connection

The following instructions describe how you can measure the speed of your wireless connection to the wireless access point.

1 Make sure that your wireless device is connected only to the wireless network. If your wireless device is also connected to the wired network, unplug the network cable.

2 Start your Web browser, and then enter the following in the address or location bar:

`http://{zonedirector-ip-address}/perf`

The Wireless Performance Tool interface loads in your browser.

3 Click the Start button. The following message appears:

`You don't have zapd installed. Please download and run the zapd.`

Zapd is a Ruckus Wireless proprietary application that simulates traffic between a client and the AP.

4 Click **OK**. Windows and Mac (Intel) download links for zapd appear on the Wireless Performance Test interface.

5 Click the zapd version that is appropriate for the client's operating system, download the zapd file, and then save it to the client's local hard drive.

6 After downloading the zapd file, locate the file, and then double-click the file to start the application. A command prompt window appears and shows the following message:

`Entering infinite loop. Enjoy the ride.`

This indicates that zapd was successfully started. Keep the command prompt window open.

7 On the Wireless Performance Test interface, click the **Start** button again. A progress bar appears below the speedometer as the tool generates traffic to measure the downlink throughput from the AP to the client. The test typically runs from 10 to 30 seconds.

When the test is complete, the results appear below the **Start** button. Information that is shown includes the downlink throughput (in Mbps) between your wireless device and the AP, as well as the packet loss percentage during the test.

If the packet loss percentage is high (which indicates poor wireless connection), try moving your wireless device to another location and run the tool again. Alternatively, contact your network administrator for assistance.

Diagnosing Poor Network Performance

You can try the following diagnostic and troubleshooting techniques to resolve poor network performance.

1 Go to **Monitor** > **Map View**.

2 Look on the map for rogue APs. If there is a large number, and they belong to neighboring networks, proceed to the next task.

3 Go to **Configure** > **Access Points**.

4 Edit each AP record, to assign each device a channel that will not interfere with other APs.

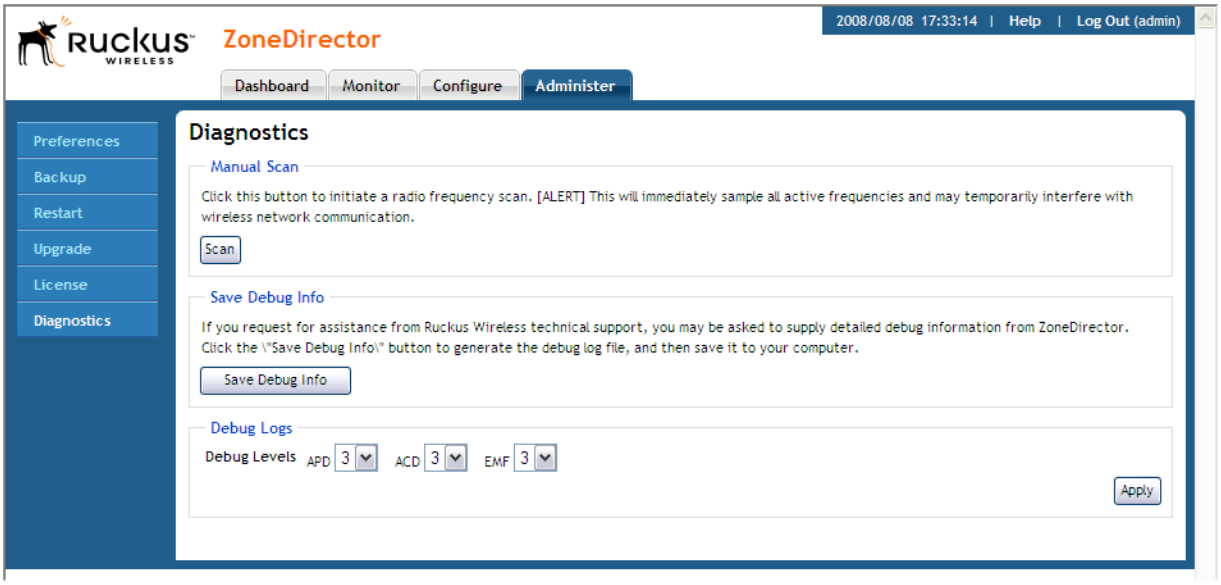
5 For example, if you have three Ruckus APs, open the *Radio B/G Channel* drop-down list in each AP record and choose “1”, “6” and “11” in each of the three. However many APs you have, make sure that each AP has a fixed channel number not too close to the number of a nearby Ruckus AP.

Starting a Radio Frequency Scan

This task complements the automatic RF scanning feature that is built into the Ruckus ZoneDirector. That automatic scan assesses one radio frequency at a time, every 20 seconds or so. To manually start a complete radio frequency scan that assesses all possible frequencies in all devices at one time, follow these steps:

1 Go to **Administer** > **Diagnostic**s.

FIGURE 8-7: The Diagnostics page


Ruckus WIRELESS
ZoneDirector
2008/08/08 17:33:14 | Help | Log Out (admin)
Dashboard
Monitor
Configure
Administer
Preferences
Backup
Restart
Upgrade
License
Diagnostics
Diagnostics
Manual Scan
Click this button to initiate a radio frequency scan. [ALERT] This will immediately sample all active frequencies and may temporarily interfere with wireless network communication.
Scan
Save Debug Info
If you request for assistance from Ruckus Wireless technical support, you may be asked to supply detailed debug information from ZoneDirector. Click the \"Save Debug Info\" button to generate the debug log file, and then save it to your computer.
Save Debug Info
Debug Logs
Debug Levels APD 3 ACD 3 EMF 3
Apply

2 When the *Diagnostics* page appears, look for the *Manual Scan* options, and then click **Scan**.

ALERT! This operation will interrupt active network connections for all current users.

3 Open the **Dashboard** or go to **Monitor > Map View** to review the scanning results. This will include rogue device detection, and an updated coverage evaluation.

Reviewing Self Healing and Intrusion Prevention Options

This Ruckus Wireless network feature adds automatic network adjustments to the existing monitoring functions, so that the Ruckus ZoneDirector can efficiently shift AP-specific settings and resources to improve coverage.

1 Go to **Configure** > **Services**.

2 Review and change the following self-healing options (which are all active by default):

Adjust AP radio power	If this capability is activated (default) and the tx power of a radio is auto (default), the Ruckus APs automatically reduce or maximize the transmit power to provide the best wireless service.
Adjust AP channel	If interference of any kind is detected in an AP, the radio frequency will automatically be switched.

3 Review and change the following intrusion prevention options (which are all active by default):

Excessive wireless requests	If this capability is activated (default), excessive 802.11 probe request frames and management frames launched by malicious attackers will be discarded.
Repeat Authentication Failure	If this capability is activated, any clients that repeatedly fail in attempting authentication will be temporarily blocked for a period of time. Default is 30 seconds.

4 Click **Apply** to save your settings. The new settings go into effect immediately.

Generating a Debug File

ALERT! Do not start this procedure unless asked to do so by technical support staff.

If requested to generate and save a debug file, follow these steps:

1 Go to **Administer** > **Diagnostics**.

2 Review the settings in the *Debug Log* options, and make the request adjustments with the three *Levels* drop-down lists. (If no settings were specified, ignore this step.)

APD	For information between Ruckus AP and Ruckus ZoneDirector
ACD	For information on wireless clients activities
EMF	For information regarding Web interface operations

3 If you did change the *Levels* settings, click **Apply** to save your settings.

4 In the *Save Debug Info* options, click **Save Debug Info**.

5 When the *File Download* dialog box appears, click Save.

6 When the *Save As* dialog box appears, pick a convenient destination folder, type a name for the file, and click **Save**.

7 When the *Download Complete* dialog box appears, click **Close**.

After the file is saved, you can email it to the technical support representative.

NOTE The debug (or diagnostics) file is encrypted and only Ruckus Wireless support representatives have the proper tools to decrypt this file.

Restarting an Access Point

One helpful fix for network coverage issues is to restart individual APs. To do so, follow these steps:

1 Go to **Monitor** > **Access Points**.

2 When the *Access Points* page appears, look in the *AP Summary* table for the particular Access Point record.

The *Status* column should display "Connected."

3 Click **Restart**. The Status column now displays "Disconnected" along with the date and time when ZoneDirector last communicated with the AP.

After restart is complete and the Ruckus ZoneDirector detects the active AP, the status will be returned to "Connected."

Restarting ZoneDirector

There are three "restart" options: [1] to disconnect and then reconnect the Ruckus ZoneDirector from the power source, [2] to follow this procedure which simultaneously shuts down ZoneDirector and all APs, then restarts all devices, and [3] a restart of individual APs (detailed in Restarting an Access Point.)

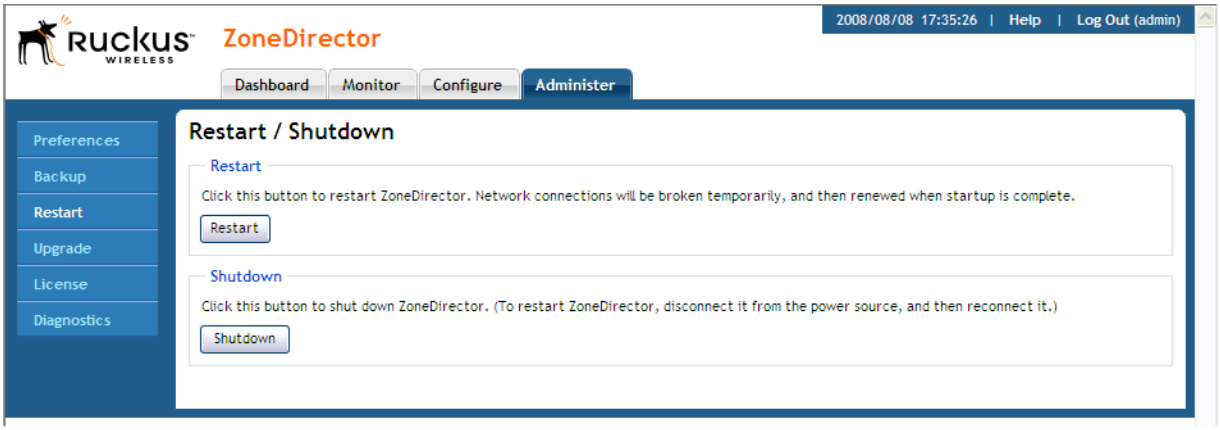
To restart ZoneDirector (and all currently active APs), follow these steps:

1 Go to **Administer** > **Restart**.

2 When the *Restart/Shutdown* features appear, click **Restart**.

You will be automatically logged out of ZoneDirector. After a minute, when the Status LED is steadily lit, you can log back into ZoneDirector.

FIGURE 8-8: The Restart/Shutdown page



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